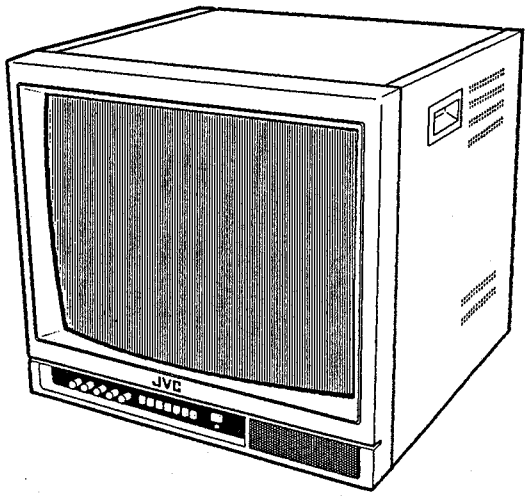
JVC

# SERVICE MANUAL

## COLOUR VIDEO MONITOR

# TM-2100E

| BASIC CHASSIS |
| --- |
| TM II |



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No.50623
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# SAFETY PRECAUTIONS

1. The design of this product contains special hardware, many circuits and components specially for safety purposes.
   For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by ( ⚠ )on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual many create shock, fire, or other hazards.
4. **Don't short between the LIVE side ground and NEUTRAL side grounding or EARTH side ground when repairing.**
   Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE ( ⊥ ) side GND, the NEUTRAL( ⏚ ) side GND and EARTH ( ⏚ ) side GND. Don't short between the LIVE side GND and NEUTRAL side GND or EARTH side GND and never measure with a measuring apparatus (oscilloscope etc.) the LIVE side GND and NEUTRAL side GND or EARTH side GND at the same time.
   If above note will not be kept, a fuse or any parts will be broken.
5. If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF $B_1$ POWER SUPPLY).
6. The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approvided by the manufacturer of the complete product.
7. Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10kΩ 2W resistor to the anode button.
8. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.
9. **Isolation Check**
   **(Safety for Electrical Shock Hazard)**
   After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

(1) **Dielectric Strength Test**
The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 3000V AC (r.m.s.) for a period of one second.
(. . . . Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)
This method of test requires a test equipment not generally found in the service trade.

(2) **Leakage Current Check**
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.) Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

**• Alternate Check Method**
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement, Any voltage measured must not exceed 0.35V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).

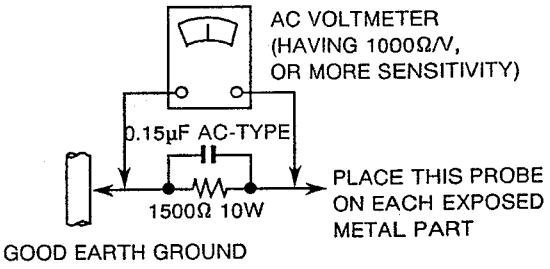



**Fig.A**

# SPECIFICATIONS

| Item | | Content |
|---|---|---|
| **Dimensions** | | W:49.6cm × D:47.9cm × H:45.8cm |
| **Weight** | | 34.6 kg |
| **Type** | | Colour video monitor |
| **Colour system** | | PAL system |
| **Power requirement** | | AC 220-240 V, 50/60 Hz |
| **Power consumption** | | Max. 0.72 A |
| **CRT** | | 55-cm (21") measured diagonally, 90° deflection, in-line gun, data-grade tinted CRT, vertical stripe phosphor pitch 0.57 mm (at CENTRE) |
| **Screen size** | | H:406mm × V:305mm |
| **Scanning frequency** | | H:15.625Hz |
| | | V:50Hz |
| **Horizontal resolution** | | More than 550 lines |
| **Audio output** | | 1.5W |
| **Speaker** | | 12 × 5cm oval × 1 |
| **INPUT A** | | |
| | VIDEO | BNC × 2 |
| | | VS 1 Vp-p, 75Ω, negative |
| | | Bridged connection is possible. (A termination switch is provided.) |
| | AUDIO | RCA pin connector × 2 |
| | | 390mVrms, high impedance |
| | | Bridged connection is possible. |
| **INPUT B** | | |
| | VIDEO | BNC × 2 |
| | | VS 1 Vp-p, 75Ω, negative |
| | | Bridged connection is possible. (A termination switch is provided.) |
| | AUDIO | RCA pin connector × 2 |
| | | 390mVrms, high impedance |
| | | Bridged connection is possible. |
| **Y/C INPUT** | | |
| | Y/C | 7-pin connector × 2 |
| | | Y 1 Vp-p, 75Ω, negative |
| | | C 0.3 Vp-p (burst), 75Ω |
| | | Bridged connection is possible. (A termination switch is provided.) |
| | AUDIO | RCA pin connector × 2 |
| | | 390 mVrms, high impedance |
| | | Bridged connection is possible. |
| **RGB analogue INPUT** | | |
| | RGB | BNC × 6 (3 with bridged output) |
| | | 0.7 Vp-p, 75Ω |
| | SYNC | BNC × 2 |
| | | 1 ~ 4 Vp-p, 75Ω, negative |
| | | Bridged connection is possible. (A termination switch is provided.) |
| | AUDIO | RCA pin connector × 2 |
| | | 390 mVrms, high impedance |
| | | Bridged connection is possible. |
| **Accessory** | | Power cord (approx. 2m) × 1 |

*Design & specification subject to change without notice.*

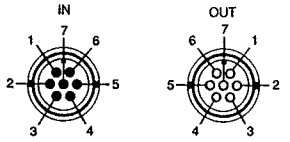
# SPECIFICATIONS

ENGLISH

| | | |
|---|---|---|
| **Type** | : | Colour video monitor |
| **Colour system** | : | PAL system |
| **CRT** | : | 55-cm (21") measured diagonally, 90° deflection, in-line gun, data-grade tinted CRT, vertical stripe phosphor pitch 0.57 mm (at CENTRE) |
| **Audio output** | : | 1.5 W |
| **Speaker** | : | 12 × 5-cm oval × 1 |
| **Screen size (H × V)** | : | 406 × 305 mm |
| **Scanning frequency** | : | (H) 15.625 kHz<br>(V) 50 Hz |
| **Horizontal resolution** | : | More than 550 lines |
| **Power requirement** | : | AC 220 – 240 V, 50/60 Hz |
| **Power consumption** | : | Max. 0.72 A |
| **INPUT A** | : | VIDEO — BNC × 2<br>VS — 1 Vp-p, 75 Ω, negative<br>Bridged connection is possible.<br>(A termination switch is provided.)<br>AUDIO — RCA pin connector × 2<br>390 mV rms, high impedance<br>Bridged connection is possible. |
| **INPUT B** | : | VIDEO — BNC × 2<br>VS — 1 V p-p, 75 Ω, negative<br>Bridged connection is possible.<br>(A termination switch is provided.)<br>AUDIO — RCA pin connector × 2<br>390 mV rms, high impedance<br>Bridged connection is possible. |
| **Y/C INPUT** | : | Y/C-7-pin connector × 2<br>Y — 1 Vp-p, 75 Ω, negative<br>C — 0.3 Vp-p (burst), 75 Ω<br>Bridged connection is possible.<br>(A termination switch is provided.)<br>AUDIO — RCA pin connector × 2<br>390 mV rms, high impedance<br>Bridged connection is possible. |
| **RGB analogue INPUT** | : | RGB — BNC × 6 (3 with bridged output), 0.7 V p-p, 75 Ω<br>SYNC — BNC × 2<br>1 – 4 V p-p, 75 Ω, negative<br>Bridged connection is possible.<br>(A termination switch is provided.)<br>AUDIO — RCA pin connector × 2<br>390 mV rms, high impedance<br>Bridged connection is possible. |
| **Weight** | : | 34.6 kg |
| **Accessory** | : | Power cord (approx. 2 m) × 1 |

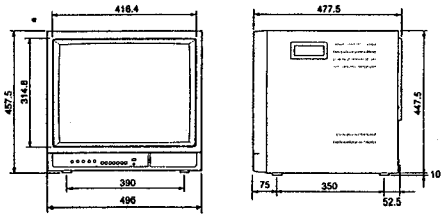
**Pin Assignment**

Y/C connectors




| Pin No. | Signal |
|---|---|
| 1 | Y |
| 2 | GND (Y) |
| 3 | – |
| 4 | – |
| 5 | C |
| 6 | GND (C) |
| 7 | – |

**Dimensions** (Unit: mm)




*Design and specifications subject to change without notice.*

INSTRUCTIONS

# JVC

# TM-2100E

## COLOUR VIDEO MONITOR

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MANUEL D'INSTRUCTIONS: MONITEUR VIDEO COULEUR
MANUAL DE INSTRUCCIONES : MONITOR DE VIDEO EN COLORES
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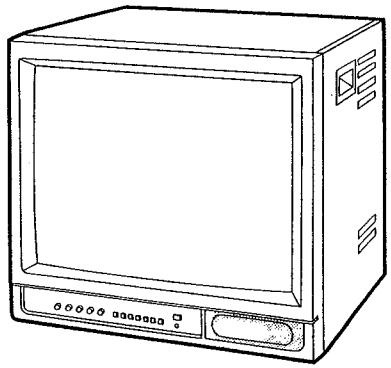

OPERATING INSTRUCTIONS

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ENGLISH

Thank you for purchasing a JVC colour video monitor. Your new monitor will provide superior-quality pictures and incorporates many useful functions.
To ensure a complete understanding of the monitor and to extend its service life, please read all instructions in this booklet and keep it in a safe place for future reference.

## FEATURES

- Multi-standard compatibility for a wide range of professional application; accepting composite video (PAL), Y/C separate, and RGB analogue signals inputs.
- 21-inch data-grade CRT, together with a horizontal resolution of more than 550 lines.
- Multi-function and superior flexibility with numerous facilities required by professional users including an under scan switch, pulse cross switch, etc.

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# SAFETY PRECAUTIONS

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In order to prevent any fatal accidents caused by misoperation or mishandling of the monitor, be fully aware of all the following precautions.

### WARNINGS

To prevent fire or shock hazard, do not expose this monitor to rain or moisture.
Dangerous high voltages are present inside the unit. Do not remove the back cover of the cabinet.
When servicing the monitor, contact qualified service personnel. Never try to service it yourself.

This unit has been equipped with an intrinsically safe cathode ray tube.
Improper operations, in particular alteration of high voltage components or changing the type of tube may result in excessive x-ray emission. A unit altered in such a way no longer meets the standards of certification, and must therefore no longer be operated.

### PRECAUTIONS

- Use only the power source specified on the rating label located on rear of the cabinet.
- When not using this unit for a long period of time, or when cleaning it, be sure to disconnect the power plug from the AC outlet.
- Do not allow anything to rest on the power cord. And do not locate this unit where people will tread on the cord.
- Do not overload wall outlets or power cords as this can result in a fire or electric shock.
- Avoid using this unit under the following conditions:
  - in extremely hot, cold or humid places,
  - in dusty places,
  - near appliances generating strong magnetic fields,
  - in places subject to direct sunlight, and
  - in badly ventilated places.
- Do not cover the ventilation slots while in operation as this could obstruct the required ventilation.
- When dust accumulates on the screen surface, clean with a soft cloth.
- Unplug this unit from the AC outlet and refer servicing to qualified service personnel under the following conditions:
  - When the power cord is frayed or plug is damaged.
  - If liquid has been spilled into the unit.
  - If the unit does not operate normally following the operating instructions.
  - If the unit has been dropped or the cabinet has been damaged.
  - When the unit exhibits a distinct change in performance.
- Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Always refer servicing to qualified service personnel.
- When replacement parts are required, have the service personnel verify in writing that the replacement parts he uses have the same safety characteristics as the original parts. Use of manufacturer's specified replacement parts can prevent fire, shock, or other hazards.
- Upon completion of any servicing or repair to this unit, please ask the service personnel to perform the safety check described in the manufacturer's service literature.
- When this unit reaches the end of its useful life, improper disposal could result in a picture tube implosion. Ask qualified service personnel to dispose of this unit.
- The supply circuit must provide a readily accessible disconnect device.
- The socket-outlet must be near this equipment and must be easily accessible.

# CONTROLS AND CONNECTORS

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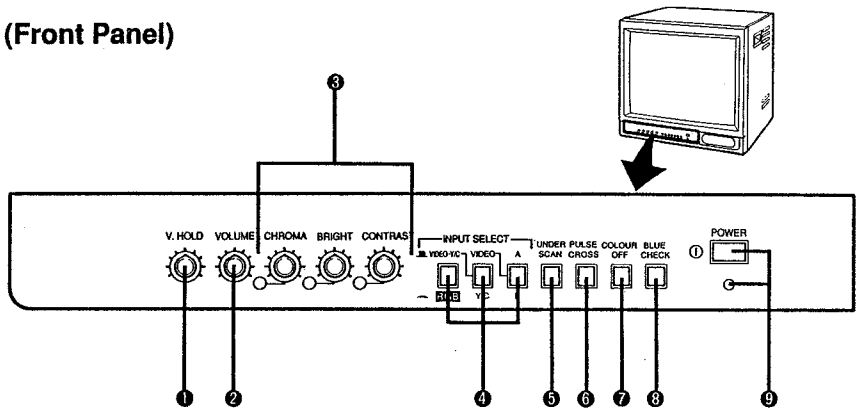
## (Front Panel)




**❶ V. HOLD control**
Turn to adjust the vertical synchronization of the picture.

**❷ VOLUME control**
Turn clockwise to make the sound louder. Counterclockwise to make it softer.

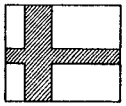
**❸ Picture controls**
Use to optimize the picture. The centre click position of each control is its standard setting. This standard setting can be varied (preset) by turning the SUB control screws at the side of the controls. Use a screwdriver to turn the SUB controls.

- **CHROMA control**
  Turn to adjust the colour density of the picture to your preference.
- **BRIGHT control**
  Turn to adjust the picture brightness to your preference.
- **CONTRAST control**
  Turn to adjust the picture contrast to your preference.

**❹ INPUT SELECT switches**
Press to select the video signals and RGB signals input to the rear connectors.
**(Selecting the signals)**
(1) Set the switch on the left to VIDEO·Y/C or RGB position.
VIDEO·Y/C (▂▁): When inputting the composite video signal or Y/C separate video signals to the monitor
RGB (▁▂): When inputting the RGB analogue signals to the monitor
(2) Set the switch on the centre to VIDEO or Y/C position.
VIDEO (▂▁): When monitoring the composite video signal
Y/C (▁▂): When monitoring Y/C separate video signals
(3) While setting the centre switch to "VIDEO", set the switch on the right to A or B position.
A (▂▁): When monitoring a signal via the INPUT A connector
B (▁▂): When monitoring a signal via the INPUT B connector

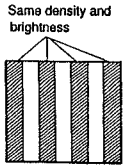
**❺ UNDER SCAN switch**
Press to switch the scanning size on the screen.
( ▂▁ ) : for overscanning
( ▁▂ ) : for underscanning

**❻ PULSE CROSS switch**
To check the retrace period (sync signal) by delaying the phase of the input signal.
OFF ( ▂▁ ) : For normal picture
ON ( ▁▂ ) : For retrace period check display
(This function is not available when RGB signals are input to the monitor.)



**❼ COLOUR OFF switch**
Switches picture between colour and monochrome for checking white balance, etc.
( ▂▁ ) : For a colour picture
( ▁▂ ) : For a monochrome picture

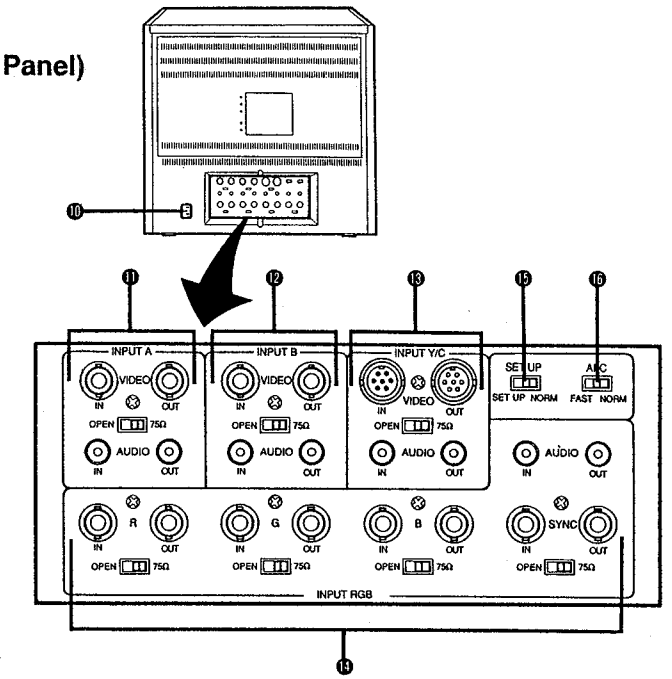
**❽ BLUE CHECK switch**
Switches the picture between normal and monochrome blue, for checking and adjusting the CHROMA.
( ▂▁ ) : Normal picture
( ▁▂ ) : Monochrome blue picture
**Adjusting procedure**
(1) Input the colour bar signal to display a monochrome blue picture.
(2) Turn the CHROMA control so that all blue bars have the same density and brightness.




**❾ POWER switch/indicator**
Pressing this switch turns the power on; the indicator lights. Pressing this switch again turns the power off; the indicator goes off.



## (Rear Panel)




**❿ Power input connector**
Connect to an AC outlet with the provided power cord.

**⓫ INPUT A connectors/Termination switch**
Input connectors for composite video and audio signals and output connectors for bridge-connected signals.
**IN** : For signal input
**OUT** : For bridged connection
**Setting the termination switch**
**75 Ω** : When there is only an input signal
**OPEN**: For bridged connection

**⓬ INPUT B connectors/Termination switch**
Input connectors for composite video and audio signals and output connectors for bridge-connected signals
**IN** : For signal input
**OUT** : For bridged connection
**Setting the termination switch**
**75 Ω** : When there is only an input signal
**OPEN**: For bridged connection

**⓭ INPUT Y/C connectors/Termination switch**
Input connectors for Y/C separate video and audio signals and output connectors for bridge-connected signals.
**IN** : For signal input
**OUT** : For bridged connection
**Setting the termination switch**
**75 Ω** : When there are only input signals
**OPEN**: For bridged connection
**Caution**: These connectors can only be connected to the Y/C443 connectors of the VTR; they cannot be connected to the other dubbing connectors (DUB, Y/C629, Y/C633, etc.)

**⓮ INPUT RGB connectors/Termination switch**
Input connectors for RGB, sync and audio signals and output connectors for bridge-connected signals.
**IN** : For signal input
**OUT** : For bridged connection
**Setting the termination switch**
**75 Ω** : When there are only input signals
**OPEN**: For bridged connection

**⓯ SET UP switch**
Do not reset this switch. It is for service personnel only.

**⓰ AFC switch**
Switches the AFC time constant of the horizontal sync circuitry to correct the skewed portion of the picture.
**FAST** : Fast mode (Smaller time constant)
**NORMAL**: Normal mode



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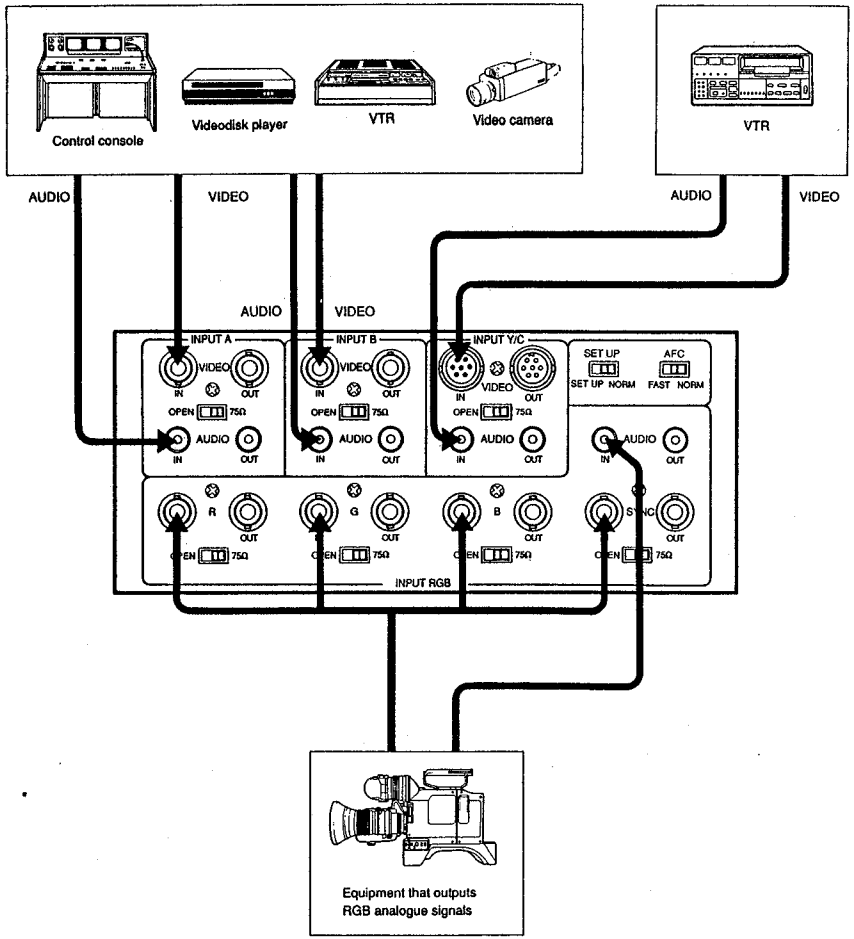
# CONNECTIONS

- Be sure to disconnect the power plug from the AC outlet before connecting to other equipment.
- Also refer to the instruction manual of the equipment to be connected.



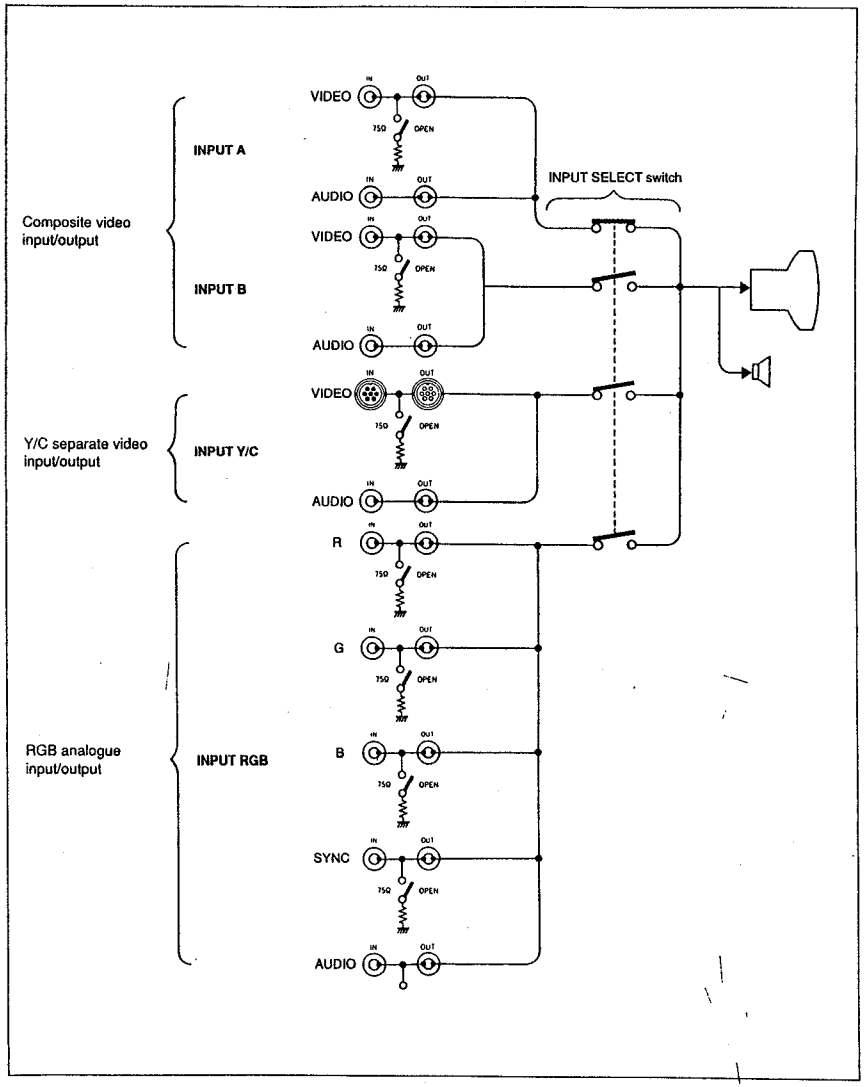

- When using any of the OUT connectors (bridged output), set its termination switch to "OPEN".



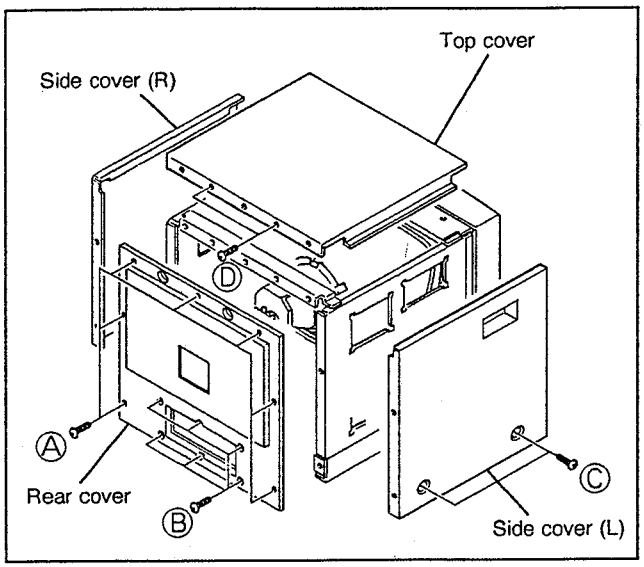
# CONNECTIONS OUTLINE DIAGRAM



The following is an outline of the circuitry and connections, showing concepts. It is not a circuit diagram.



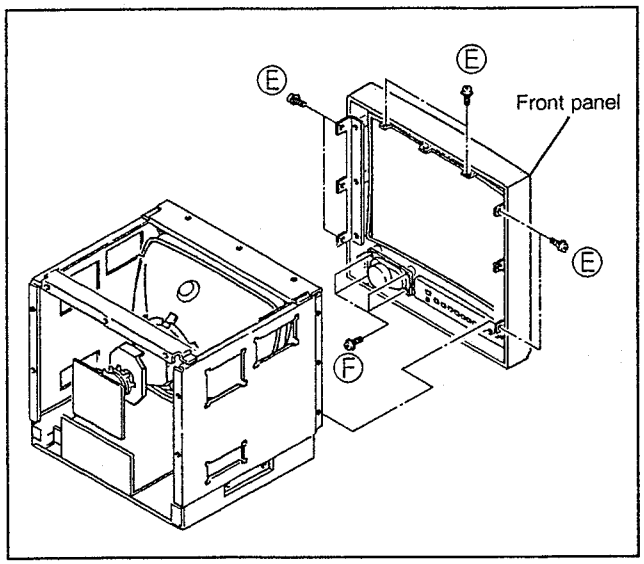
# SPECIFIC SERVICE INSTRUCTIONS




## DISASSEMBLY PROCEDURE

### ■ Removing the external parts

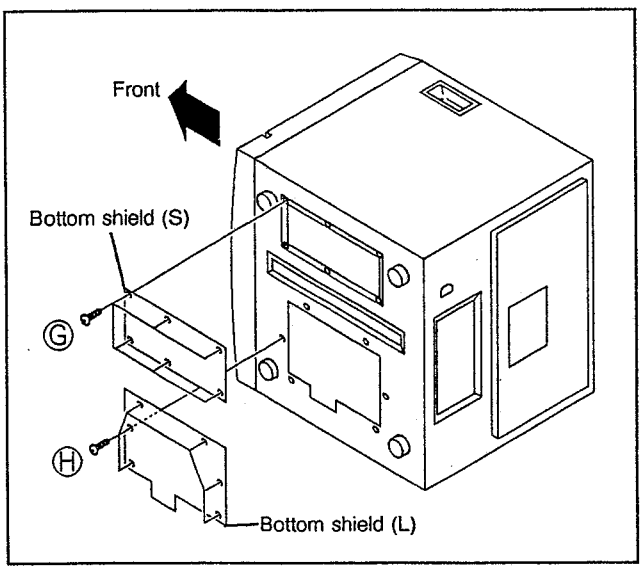
1. Turn the power off for the unit and remove the power cord from the wall outlet.
2. Remove the seven screws of Ⓐ and the six screws of Ⓑ, then remove the rear cover.
3. Remove the four screws of Ⓒ, then remove the side cover (L) and the side cover (R).
4. Remove the two screws of Ⓓ, then remove the top cover.




### ■ Removing the front panel

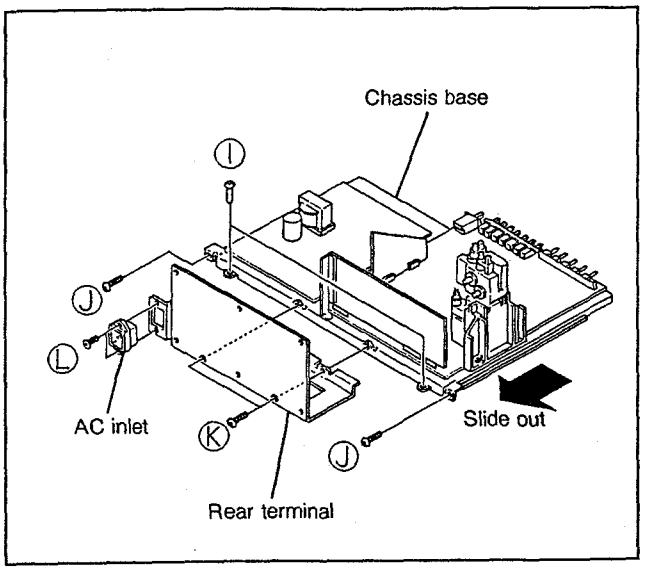
- Remove the external parts.

1. Remove the six screws of Ⓔ.
2. Remove the front panel.
3. Separate the speaker connector.
4. Remove the four screws of Ⓕ, then remove the speaker.




### ■ Checking the Print wiring board

1. Set the TV set sideways.
   In this case, lay soft cloth, etc. under the set in advance to prevent any damage to the external parts.
2. Remove the six screws of Ⓖ, then remove the bottom shield (S).
3. Remove the six screws of Ⓗ, then remove the bottom shield (L).
4. Check the PWB at this state.
   In case it is impossible to check under this condition, pull out and check the chassis base according to the procedure in "Pulling out the chassis base".




## ■ Pulling out the chassis base

- Remove the external parts.

1. Remove the two screws of Ⓘ and the two screws of Ⓙ.
2. Slide the chassis base out toward the back.
   While removing the base, carefully unplug the connectors for the wires which are being pulled out along with it.
   Before resupplying electricity to the unit again, make sure that these wires are reinserted properly in place.
3. Remove the two screws of Ⓚ, then remove the rear terminal.
4. Remove the two screws of Ⓛ and the wires, then remove the AC inlet.

## ■ Precautions for wire clamp and binding band

1. The wire should be clamped exactly.
2. Be sure not to remove the binding band for wire treatment. Should it be removed, the wire should be treated exactly to the initial position.

# SERVICE ADJUSTMENTS

## PRIOR TO STARTING ADJUSTMENT

- Perform sufficient warm-up of the TV set and testers. (for 30 minutes or more).
- Unless specified otherwise specially in ADJUSTING STEP given below, perform adjustment after setting the VRs on the front panel to the following positions:

  CONTRAST : CLICK position
  BRIGHT : CLICK position
  CHROMA : CLICK position
  BLUE CHECK : OFF (Normal picture)
  COLOUR OFF : OFF (Colour picture)
  PULSE CROSS : OFF (Normal picture)
  UNDER SCAN : OFF (Overscan)
- Regarding the list of the layout of adjusted parts, refer to MAINPARTS LOCATION AND ALIGNMENT LOCATION in SCHEMATIC DIAGRAM.

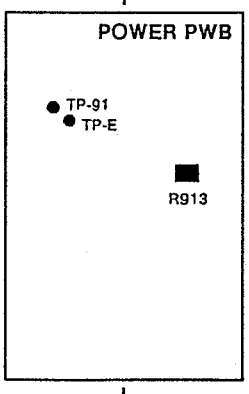
## TOOLS AND FIXTURES FOR ADJUSTMENT

- DC voltmeter or digital voltmeter
- Oscilloscope
- Pattern generator (PAL)
  · If monoscope signal can be output, it is possible to perform further accurate adjustment.
- Color thermometer
  · Adjustment is possible without it. If available, however, further accurate adjustment is possible.
- Short jumper

## ADJUSTING STEP

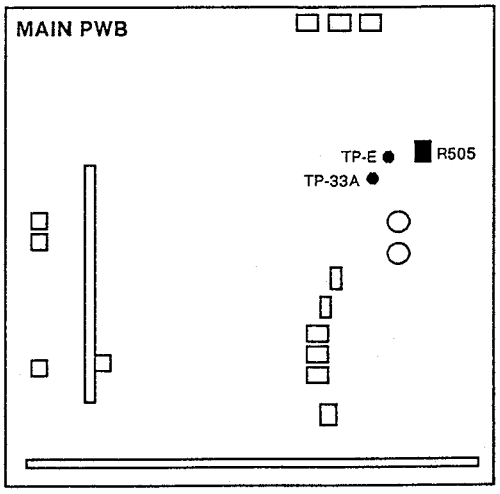
■ POWER PWB

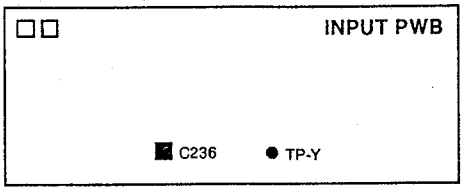
| Item | Measuring instrument | Test point | Adjustment part | Description |
|---|---|---|---|---|
| Adjustment of B1 VOLTAGE | PATTERN GENERATOR<br><br>DC VOLTMETER or DIGITAL VOLTMETER | TP-91<br>TP-E(⏚) | B1 ADJUST (R913) | 1. Input the black field pattern signal.<br>2. Adjust the B1 ADJUST VR (R913) so that the voltage between TP-91 and TP-E (⏚) becomes DC 110 ± 1V.<br>3. Confirm that the B1 voltage scarcely changes even when the input signal has been changed. |

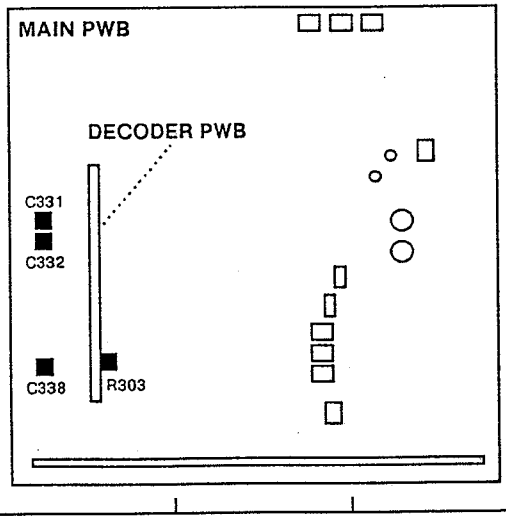


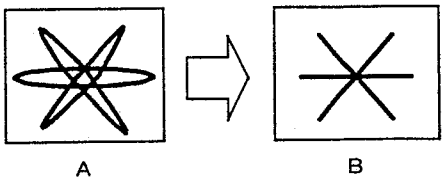
## ■ MAIN PWB (1) and DECODER PWB

| Item | Measuring instrument | Test point | Adjustment part | Description |
|---|---|---|---|---|
| Adjustment of HORIZONTAL SYNCHRONISM | PATTERN GENERATOR<br><br>SHORT JUMPER (TP-33A - TP-E) | | H HOLD (R505) | • Set the CONTRAST VR on the front panel to the clicking position.<br>1. Input the color bar signal.<br>2. Connect TP-33A and TP-E with a short jumper.<br>3. Adjust the H. FREQ. VR (R505) to a position where the image remains at a standstill without flowing horizontally.<br>• Namely, adjust the VR to an intermediate position where the image flows horizontally.<br>4. Remove the connected short jumper. |
| Adjustment of NOCTH CIRCUIT | PATTERN GENERATOR<br><br>OSCILLOSCOPE | TP-Y [INPUT PWB] | C236 [INPUT PWB] | 1. Input the color bar signal.<br>2. Connect the oscilloscope between TP-Y and TP-E.<br>3. Adjust the C236 so that the CHROMA component becomes minimum. |
| Adjustment of PAL APC | PATTERN GENERATOR<br><br>OSCILLOSCOPE | TP-48 [DECODER PWB]<br>TP-49 [DECODER PWB] | DL AMP (R303)<br>C331<br>C332<br>C338 | 1. Input the color bar signal.<br>2. Connect the oscilloscope to TP-48 and TP-49, and plot the X-Y coordinates.<br>3. Adjust with R303, C331 and C332 so that the waveforms are the shapes shown from A to B in the chart below.<br>When it is not possible to adjust with the "R303, C331 and C332", adjust with C338. |



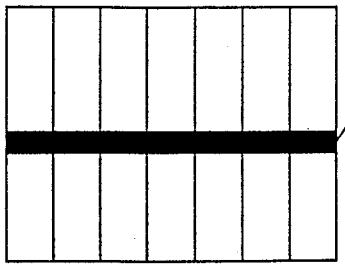



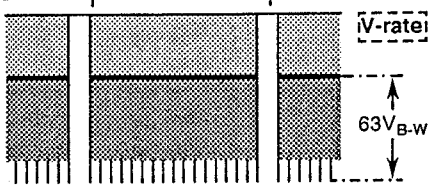



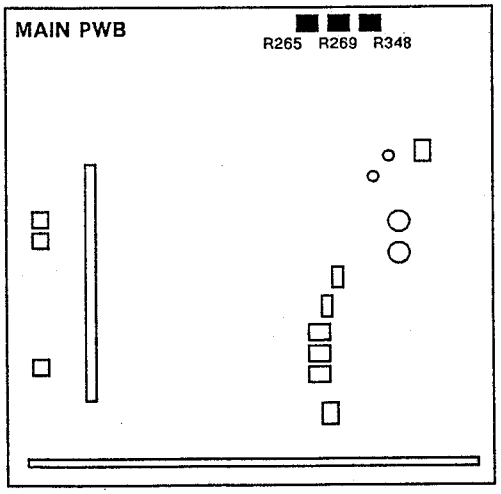



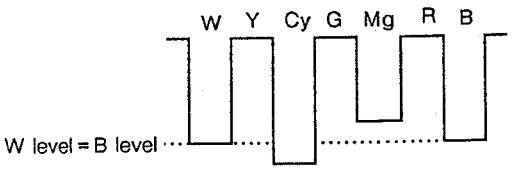
■ MAIN PWB (2)

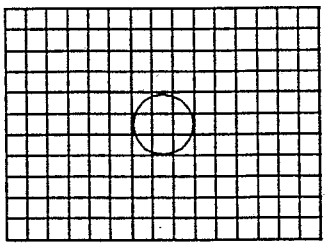
| Item | Measuring instrument | Test point | Adjustment part | Description |
|---|---|---|---|---|
| Adjustment of SUB BRIGHT (VIDEO) | PATTERN GENERATOR | | SUB BRIGHT (R269) | • Continue running for 30 minutes or more.<br>• Set the CONTRAST and BRIGHT VRs on the front panel to the clicking position.<br>1. Input the color bar signal.<br>2. Turn the V. HOLD VR to display the vertical flyback time and let it remain at a standstill.<br>3. Adjust the SUB BRIGHT VR (R269) in front of the position where the vertical flyback time becomes black (In this case, be careful so that it will not become too bright).<br>4. Adjust the vertical synchronism with the V. HOLD VR. |
| Adjustment of SUB CONTRAST (VIDEO) | PATTERN GENERATOR<br>OSCILLOSCOPE [V-rate] | TP-47B [CRT S. PWB] | SUB CONT (R265) | • Set the CONTRAST and BRIGHT VRs on the front panel to the clicking position.<br>1. Input the cross hatch signal (including 100% white).<br>2. Connect the oscilloscope between TP-47B and TP-E on the CRT socket PCB.<br>3. Adjust the SUB CONT. VR (R265) so that the voltage of the waveform becomes 63 $V_{B-W}$. |
| Adjustment of SUB CHROMA | PATTERN GENERATOR<br>OSCILLOSCOPE | TP-47B [CRT S. PWB] | SUB CHROMA (R348) | • Set the CHROMA VR on the front panel to the clicking position.<br>1. Input the color bar signal.<br>2. Connect the oscilloscope between TP-47B and TP-E on the CRT socket PCB.<br>3. Turn the SUB PAL COLOR VR (R348) to set the difference of white and blue levels to 0V. |
| Adjustment of FOCUS | PATTERN GENERATOR | | FOCUS VR | 1. Input the cross hatch signal.<br>2. Adjust the FOCUS VR to a position where the vertical and horizontal lines of cross hatch become thinnest and clearest.<br>Note: Be sure to perform final adjustment of the convergence after adjustment of focus, since the convergence will be changed whenever the focus has been adjusted. |

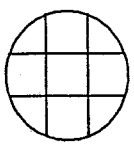


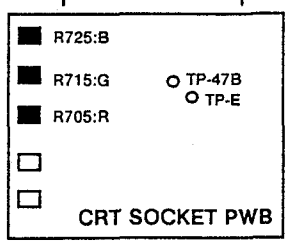
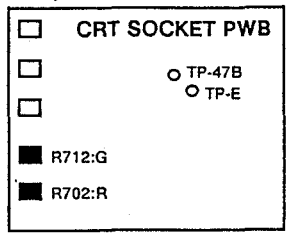





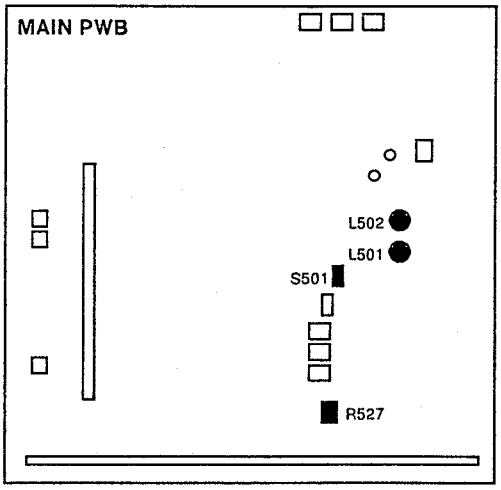
Both the vertical and horizontal lines should be made thin.

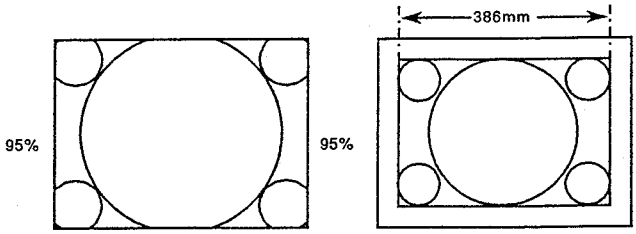
■ CRT SOCKET PWB

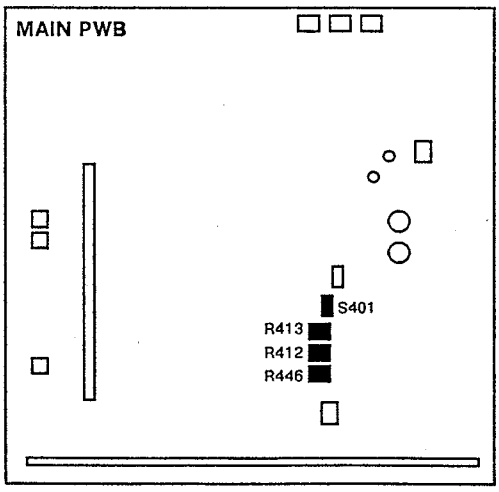
| Item | Measuring instrument | Test point | Adjustment part | Description |
|---|---|---|---|---|
| Adjustment of WHITE BALANCE (CUTOFF) | PATTERN GENERATOR |  | R CUT OFF (R705)<br>G CUT OFF (R715)<br>B CUT OFF (R725)<br>SCREEN VR | • Continue running for 30 minutes or more.<br>1. Input the black field pattern signal.<br>2. Turn the [SET UP] switch (S203) on the rear surface over to the SET UP side.<br>3. Turn the CUT OFF VRs (R705, R715 and R725) on the CRT SOCKET PWB fully in counterclockwise direction.<br>4. While turning the SCREEN VR gradually in clockwise direction from full counterclockwise direction, search for the color appearing for the first time.<br>5. Turn the CUT OFF VRs, with which the color has appeared first in the Step 4, slightly in clockwise direction.<br>6. By turning the CUT OFF VRs for the other two colors in clockwise direction, adjust the intensity of the three shining colors so that the transverse single line look white.<br>7. Return the [SET UP] switch (S203) to the NORMAL side. |
| Adjustment of WHITE BALANCE (DRIVE) | PATTERN GENERATOR |  | R DRIVE (R702)<br>G DRIVE (R712) | • Continue running for 30 minutes or more.<br>• This adjustment should be performed after **Adjustment of WHITE BALANCE (CUTOFF).**<br>1. Input the white field pattern signal.<br>2. Adjust the R and G DRIVE VRs (R702 and R712) on the CRT SOCKET PWB to a position where the entire screen becomes white.<br>3. While turning the CONTRAST VR and BRIGHT VR on the front panel, make sure that the white balance is attained.<br><br>**[In case monoscope signal and color temperature meter are available]**<br>1. Input the monoscope signal.<br>2. The light receiving unit of the color temperature meter will measure the color temperature at the center of the screen.<br>3. Adjust the CONTRAST VR, R and G DRIVE VRs (R702 and R712) on the CRT SOCKET PWB to a position where the color temperature meter indicates a specified value.<br>• **Color temperature**<br>**: D6500°K** (x = 0.313, y = 0.329)<br>4. While turning the CONTRAST VR and BRIGHT VR on the front panel, make sure that the white balance is attained. |

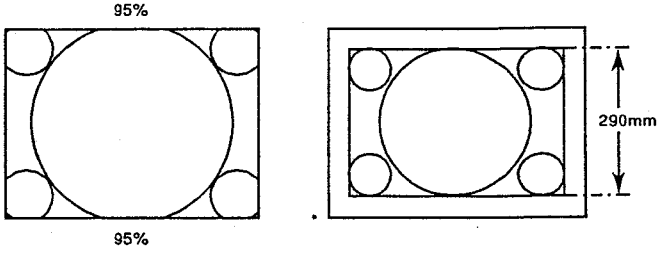
## ■ MAIN PWB (3)

| Item | Measuring instrument | Test point | Adjustment part | Description |
|---|---|---|---|---|
| Adjustment of H. WIDTH and H. CENTER | PATTERN GENERATOR | | H POSI (R527)<br>H CENTER (S501)<br>H WIDTH (L502)<br>H WIDTH (L501) | 1. Input the monoscope signal or cross hatch signal.<br>2. Select the UNDER SCAN screen with the [UNDER SCAN] switch on the front panel.<br>3. With the H. POSITION VR (R527) and CENTER switch (S501), adjust the picture image to the center of the screen.<br>4. With the H. WIDTH coil (L502), adjust the horizontal width of picture image to 386 mm.<br>5. Select the OVER SCAN screen with the [UNDER SCAN] switch on the front panel.<br>6. Adjust the H. WIDTH COIL (L501) so that 95% of monoscope pattern (cross hatch) is displayed on the screen. |
| Adjustment of V. HEIGHT, V. CENTER and V. LINEARITY | PATTERN GENERATOR | | V HIGHT 1 (R413)<br>V HIGHT 2 (R412)<br>V CENTER (S401)<br>V LIN (R446) | 1. Input the monoscope signal or cross hatch signal.<br>2. Select the OVER SCAN screen with the [UNDER SCAN] switch on the front panel.<br>3. With the V. HEIGHT VR (R413) and V. CENTER switch (S401), perform adjustment so that 95% of the monoscope pattern (cross hatch) is displayed on the screen.<br>4. While turning the V. LIN. VR (R413), adjust the vertical linearity.<br>5. Repeat the Steps 3 - 4 as required.<br>6. Select the UNDER SCAN screen with the [UNDER SCAN] switch on the front panel.<br>7. With the V. HEIGHT VR (R412), adjust the vertical width of picture image to 290 mm.<br>8. Perform fine adjustment of the center and vertical linearity so that displacement of adjustment will not occur even if the [UNDER SCAN] switch on the front panel has been changed over.<br>9. Select the OVER SCAN screen with the [UNDER SCAN] switch on the front panel. |



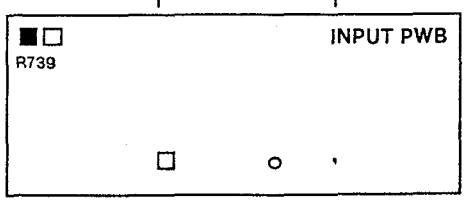



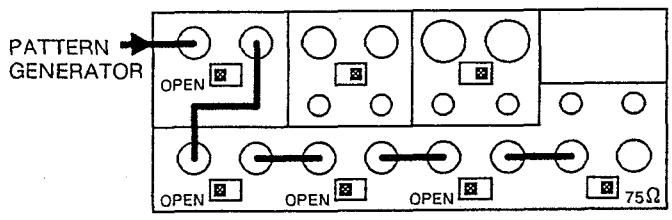



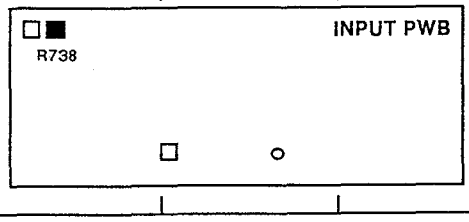



■ INPUT PWB

| Item | Measuring instrument | Test point | Adjustment part | Description |
|---|---|---|---|---|
| Adjustment of SUB BRIGHT (RGB) | PATTERN GENERATOR | | RGB BRIGHT (R739) | • This adjustment should be performed after **SUB BRIGHT (VIDEO)** and **SUB CONTRAST (VIDEO)**.<br>1. Input the monochrome (black and white) signal to the VIDEO A, R, G, B and SYNC terminals by bridge connection.<br>2. By alternately turning on and off the [RGB] switch on the front panel, adjust the brightness of the black portion with R730 so that the brightness becomes equal at the time of inputting both video and RGB. |
| Adjustment of SUB CONTRAST (RGB) | PATTERN GENERATOR | | RGB CONT (R738) | • This adjustment should be performed after **SUB BRIGHT (RGB)**.<br>1. Input the monochrome (black and white) signal to the VIDEO A, R, G, B and SYNC terminals by bridge connection.<br>2. By alternately turning on and off the [RGB] switch on the front panel, adjust the contrast with R738 so that the contrast becomes equal at the time of inputting both video and RGB. |



# PARTS LIST

## CAUTION

- The parts marked ⚠ are very important for the safety. When replacing these parts, be sure to use specified ones to secure the safety and performance.
- The module circuit board is supplied together with the assembly, but the parts which do not have the drawing in this Parts List, P. C. Board Ass'y and the Parts No. columns of which are filled with lines —— . will not be supplied.
- As a rule, the resistors and capacitors which are indicated as shown in (NOTE 2) "HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS" are not shown in the list of the parts on the board.
  When ordering the service parts, confirm the resistance/rated power, capacitance/rated voltage, and type of the parts, then order by the part No. indicated according to (NOTE 2).

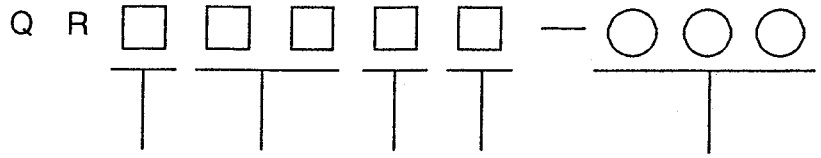
### ( NOTE 1 ) ABBREVIATIONS OF RESISTORS, CAPACITORS AND TOLERANCES

| RESISTORS | | CAPACITORS | |
|---|---|---|---|
| C R | Carbon Resistor | C CAP. | Ceramic Capacitor |
| F R | Fusible Resistor | E CAP. | Electrolytic Capacitor |
| P R | Plate Resistor | M CAP. | Mylar Capacitor |
| V R | Variable Resistor | HV CAP. | High Voltage Capacitor |
| HV R | High Voltage Resistor | MF CAP. | Metalized Film Capacitor |
| MF R | Metal Film Resistor | MM CAP. | Metalized Mylar Capacitor |
| MG R | Metal Glazed Resistor | MP CAP. | Metalized Polystyrol Capacitor |
| MP R | Metal Plate Resistor | PP CAP. | Polypropylene Capacitor |
| OM R | Metal Oxide Film Resistor | PS CAP. | Polystyrol Capacitor |
| CMF R | Coating Metal Film Resistor | TF CAP. | Thin Film Capacitor |
| UNF R | Non-Flammable Resistor | MPP CAP. | Metalized Polypropylene Capacitor |
| CH V R | Chip Variable Resistor | TAN. CAP. | Tantalum Capacitor |
| CH MG R | Chip Metal Glazed Resistor | CH C CAP. | Chip Ceramic Capacitor |
| COMP. R | Composition Resistor | BP E CAP. | Bi-Polar Electrolytic Capacitor |
| LPTC R | Linear Positive Temperature Coefficient Resistor | CH AL E CAP. | Chip Aluminum Electrolytic Capacitor |
| | | CH AL BP CAP. | Chip Aluminum Bi-Polar Capacitor |
| | | CH TAN. E CAP. | Chip Tantalum Electrolytic Capacitor |
| | | CH AL BP E CAP. | Chip Tantalum Bi-Polar Electrolytic Capacitor |

| TOLERANCES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| F | G | J | K | M | N | R | H | Z | P |
| ±1% | ±2% | ±5% | ±10% | ±20% | ±30% | +30%<br>- 10% | +50%<br>- 10% | +80%<br>- 20% | +100%<br>- 0% |

## ( NOTE 2 ) HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS

### ■ RESISTOR




| Symbol | Part Name |
|---|---|
| C | COMP.R |
| D | C R |
| S | CH MG R |

| Symbol | Rated Power |
|---|---|
| 0 1 | 1 w |
| 1 2 | 1/2 w |
| 1 4 | 1/4 w |
| 1 6 | 1/6 w |
| 1 8 | 1/8 w |

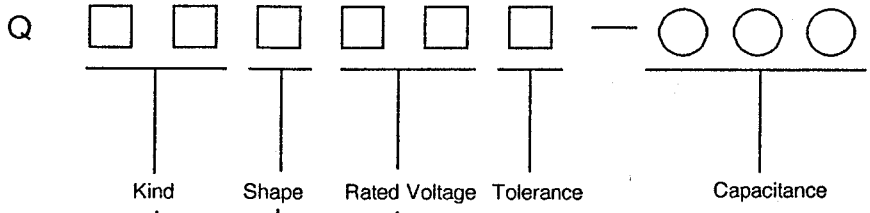
| Symbol | Shape |
|---|---|
| 1 | Straight lead |
| 8 | Chip |

Indicate with first two-figure expressed by Ω and following 0.
please note that,in case of resistance less than 10 Ω, a letter "R"will be effective as point.

EX.

| | | | |
|---|---|---|---|
| 2.2 Ω | = | | 2R2 |
| 470 Ω | = | $47\times10^{1}$ → | 471 |
| 150kΩ | = | $15\times10^{4}$ → | 154 |

### ■ CAPACITOR




| Symbol | Part Name |
|---|---|
| CS | C CAP. |
| CS | CH C CAP. |
| ET | E CAP. |
| FM | M CAP. |

| 5Figure / 6Figure | 0 | 1 | 2 |
|---|---|---|---|
| A | | 10V | 100V |
| C | | 16V | 160V |
| D | | | 200V |
| E | | 25V | 250V |
| H | | 50V | 500V |
| J | 6.3V | 63V | |
| V | | 35V | |

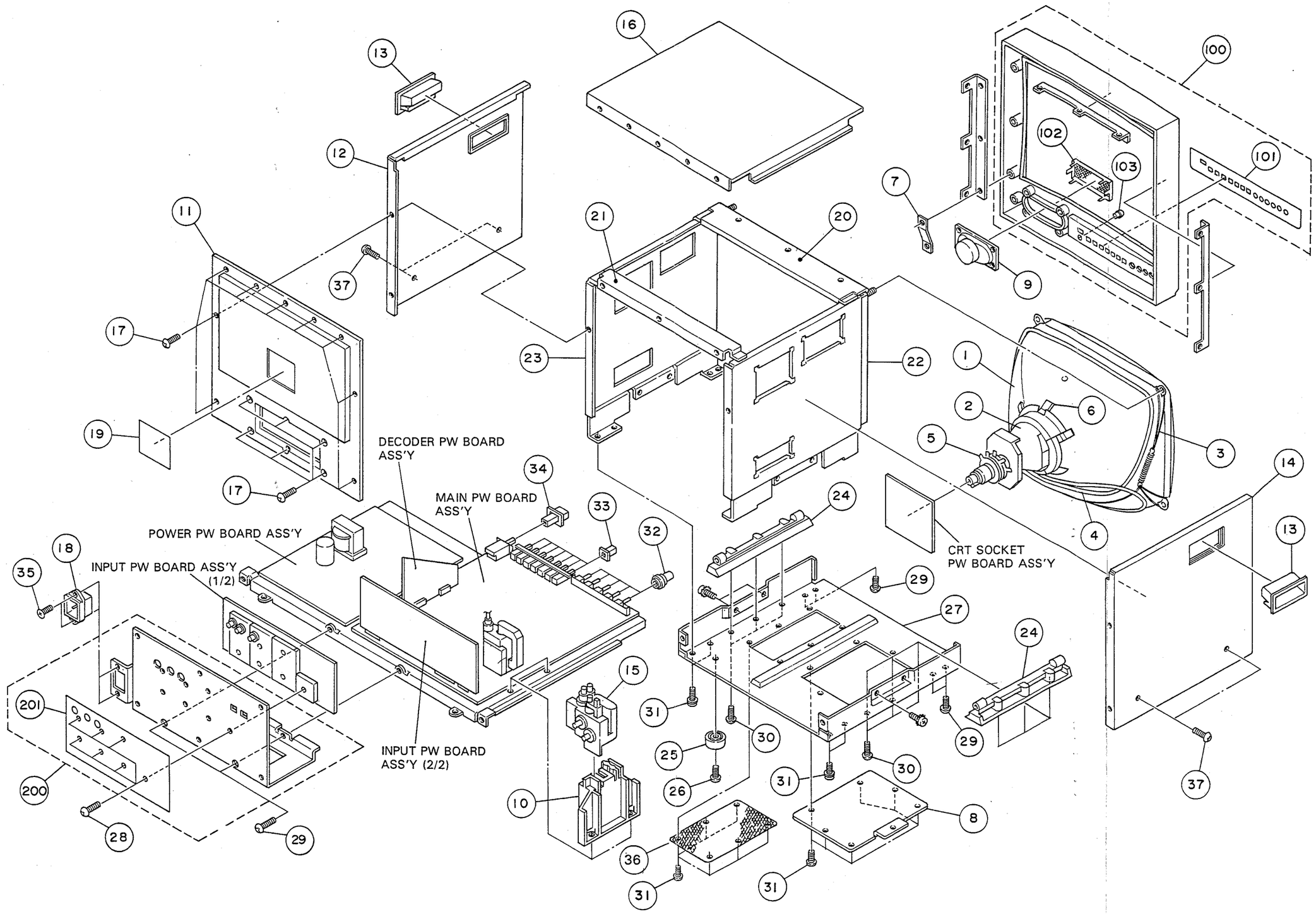
Indicate with first two-figure expressed by pF and following 0.
Please note that,in case of capacitance less than 10 pF a letter "R" will be effective as point.

EX

| | | | |
|---|---|---|---|
| 5pF | = | | 5R0 |
| 1000pF | = | $10\times10^{2}$ → | 102 |
| 47μF | = | $47\times10^{6}$ → | 476 |

| Symbol | Shape |
|---|---|
| 1 | Straight lead |
| 1 | Leads in the same direction |
| 8 | Chip |
| A | Leads in the same direction (compact part) |

## EXPLODED VIEW


DECODER PW BOARD ASS'Y
MAIN PW BOARD ASS'Y
POWER PW BOARD ASS'Y
INPUT PW BOARD ASS'Y (1/2)
INPUT PW BOARD ASS'Y (2/2)
CRT SOCKET PW BOARD ASS'Y

# EXPLODED VIEW PARTS LIST

| | SYMBOL. NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|---|
| ⚠ | 1 | A51JRU90X (WQI) | PICTURE TUBE | V01 |
| ⚠ | 2 | CE20230-00A | DEF YOKE ASSY | DY01 |
| | 3 | CH30302-00Q | BRAIDED ASSY | |
| ⚠ | 4 | CELD003-002 | DEGAUSSING COIL | L01 |
| | 5 | A75034-B | P. C. MAGNET | |
| | 6 | CE40764-00A | WEDGE ASSY | ×4 |
| | 7 | CM47320-001 | EARTH PLATE | |
| | 8 | CM22521-001 | BOTTOM SHIELD | |
| ⚠ | 9 | EAS-12D123D | CONE SPEAKER | SP01 |
| | 10 | CM22383-001 | HVT HOLDER | |
| | 11 | CM12142-A01-M0 | REAR COVER | |
| | 12 | CM12138-A01 | SIDE COVER (R) | |
| | 13 | CM35326-A01 | HANDLE | ×2 |
| | 14 | CM12138-A02 | SIDE COVER (L) | |
| ⚠ | 15 | CJ27734-00B | FLYBACK TRANSF | T1501 |
| | 16 | CM12139-A01 | TOP COVER | |
| | 17 | SBSB4010M | TAPPING SCREW | ×9 |
| | 17 | SBSB4010M | TAPPING SCREW | ×6 |
| ⚠ | 18 | QMCB005-001 | 3P INLET | |
| | 19 | CM21938-004 (R) | ROLL R LABEL | |
| | 20 | CM12135-B01 | FRONT BAR | |
| | 21 | CM12136-A01 | REAR BAR | |
| | 22 | CM12128-A0B | FRAME ASSY (L) | |
| | 23 | CM12128-A0A | FRAME ASSY (R) | |
| | 24 | CM31015-A03-V0 | CHASSIS RAIL | ×2 |
| | 25 | CN40054-00F | FOOT ASSY | ×4 |
| | 26 | SBSB4012Z | TAPPING SCREW | ×4 |
| | 27 | CM12131-B0A | BOTTOM ASSY | |
| | 28 | SBSB3008M | TAPPING SCREW | ×7 |
| | 29 | CM44287-00A | ASSY SCREW | ×4 |
| | 29 | CM44287-00A | ASSY SCREW | ×2 |
| | 30 | SBSB4012Z | TAPPING SCREW | ×6 |
| | 31 | CM44286-00A | ASSY SCREW | ×4 |
| | 31 | CM44286-00A | ASSY SCREW | ×7 |
| | 31 | CM44286-00A | ASSY SCREW | ×6 |
| | 32 | CM46043-B01 | VOLUME KNOB | ×5 |
| | 33 | CM46044-001 | PUSH KNOB | ×7 |
| | 34 | CM46115-B01 | POWER KNOB | |
| | 35 | SSSB3008Z | TAPPING SCREW | ×2 |
| | 36 | CM35417-A01 | BOTTOM SHIELD | |
| | 37 | CM44286-00E | ASSY SCREW | ×4 |
| | 100 | CM12140-A0A-M0 | FRONT PANEL ASSY | |
| | 101 | CM22375-001 | CONTROL SHEET | |
| | 102 | CM35325-001 | PUNCH METAL | |
| | 103 | CM46116-A01 | LED LENS | |
| | 200 | CM12310-00A | R. TERMINAL ASSY | |
| | 201 | CM22382-001 | TERMINAL SHEET | |

# PRINTED WIRING BOARD PARTS LIST

## 1.MAIN PW BOARD ASS'Y (FX-1039A)

| SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|
| VARIABLE R | | | |
| R1101 | QVAZ005-C004A | V R (V. HOLD, CONT. | BRIGHT, CHROMA, VOL. ) |
| R1265 | QVPA603-223AZ | V R (SUB CONTRAST | ) 22kΩ B |
| R1269 | QVPA603-103AZ | V R (SUB BRIGHT) | 10kΩ B |
| R1348 | QVPA603-103AZ | V R (SUB CHROMA) | 10kΩ B |
| R1412 | QVPC611-501HZ | V R (V. HEIGHT2) | 500 Ω B |
| R1413 | QVPC611-501HZ | V R (V. HEIGHT1) | 500 Ω B |
| R1446 | QVPC611-501HZ | V R (V. LIN) | 500 Ω B |
| R1505 | QVPC611-502HZ | V R (H. HOLD) | 5kΩ B |
| R1527 | QVPC611-103HZ | V R (H. POSITION) | 10kΩ B |
| RESISTOR | | | |
| R1414 | QRX019J-2R7S | MF R | 2.7 Ω 1W J |
| R1418 | QRG019J-102S | OM R | 1kΩ 1W J |
| R1419 | QRD123J-222SX | C R | 2.2kΩ 1/2W J |
| R1427 | QRX029J-2R2A | MF R | 2.2 Ω 2W J |
| ⚠ R1502 | CJ39622-00H | RESISTOR ARRAY | |
| R1524 | QRG019J-560S | OM R | 56 Ω 1W J |
| R1525 | QRD123J-271SX | C R | 270 Ω 1/2W J |
| R1531 | QRG029J-102A | OM R | 1kΩ 2W J |
| R1532 | QRG039J-822A | OM R | 8.2kΩ 3W J |
| R1537 | QRX029J-R82A | MF R | 0.82 Ω 2W J |
| R1541 | QRD123J-220SX | C R | 22 Ω 1/2W J |
| ⚠ R1542 | QRG029J-102A | OM R | 1kΩ 2W J |
| ⚠ R1543 | QRG029J-102A | OM R | 1kΩ 2W J |
| ⚠ R1544 | QRG019J-102S | OM R | 1kΩ 1W J |
| R1641 | QRG029J-120 | OM R | 12 Ω 2W J |
| R1879 | QRD123J-391SX | C R | 390 Ω 1/2W J |
| R1950 | QRD123J-681SX | C R | 680 Ω 1/2W J |
| CAPACITOR | | | |
| C1202 | QCT25CH-560AZ | C CAP. | 56pF 50V J |
| C1204 | QCT25CH-470AZ | C CAP. | 47pF 50V J |
| C1205 | QCT25CH-101AZ | C CAP. | 100pF 50V J |
| C1222 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C1223 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C1225 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C1227 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C1331 | QAT3710-300MZ | TRIM CAP. | |
| C1332 | QAT3710-300MZ | TRIM CAP. | |
| C1333 | QFLC1HJ-104MZ | M CAP. | 0.1μF 50V J |
| C1334 | QFLC1HJ-104MZ | M CAP. | 0.1μF 50V J |
| C1335 | QCT25CH-470AZ | C CAP. | 47pF 50V J |
| C1336 | QCT25CH-470AZ | C CAP. | 47pF 50V J |
| C1338 | QAT3710-300MZ | TRIM CAP. | |
| C1401 | QFLC1HJ-103MZ | M CAP. | 0.01μF 50V J |
| C1402 | QEE61VK-225BZ | TAN. CAP. | 2.2μF 35V K |
| C1404 | QFLC1HJ-682MZ | M CAP. | 6800pF 50V J |
| C1409 | QFLC1HJ-103MZ | M CAP. | 0.01μF 50V J |
| C1410 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C1411 | QFLC1HJ-102MZ | M CAP. | 1000pF 50V J |
| C1412 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C1415 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C1416 | QFLC1HJ-473MZ | M CAP. | 0.047μF 50V J |
| C1417 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C1425 | QFK62AJ-474M | MM CAP. | 0.47μF 100V J |
| C1426 | QFV71HJ-224MZ | TF CAP. | 0.22μF 50V J |
| C1427 | QFV71HJ-154MZ | TF CAP. | 0.15μF 50V J |
| C1502 | QFLC1HJ-222MZ | M CAP. | 2200pF 50V J |
| C1504 | QFP31HJ-332SZ | PP CAP. | 3300pF 50V J |
| C1506 | QFLC1HJ-332MZ | M CAP. | 3300pF 50V J |

| | SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|---|
| | CAPACITOR | | | |
| | C1513 | QEM51CM-337M | E CAP. | 330μF 16V M |
| | C1514 | QFLC1HJ-563MZ | M CAP. | 0.056μF 50V J |
| | C1516 | QFLC1HJ-153MZ | M CAP. | 0.015μF 50V J |
| | C1517 | QFLC1HJ-333MZ | M CAP. | 0.033μF 50V J |
| | C1518 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| ⚠ | C1522 | QFZ0117-4801S | M P P CAP. | 4800pF 2000V±2.5% |
| ⚠ | C1523 | QFZ0117-3601S | M P P CAP. | 3600pF 2000V±2.5% |
| | C1524 | QFZ0089-534S | M P P CAP. | 0.53μF 200V J |
| | C1525 | QFV71HJ-474MZ | TF CAP. | 0.47μF 50V J |
| | C1529 | QEH52EM-336M | E CAP. | 33μF 250V M |
| | C1530 | QFLC1HJ-122MZ | M CAP. | 1200pF 50V J |
| | C1533 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| | C1534 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| | C1536 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| | C1616 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| | C1617 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| | C1620 | QFV71HJ-224MZ | TF CAP. | 0.22μF 50V J |
| | C1622 | QFLC1HJ-152MZ | M CAP. | 1500pF 50V J |
| | C1624 | QFLC1HJ-222MZ | M CAP. | 2200pF 50V J |
| | C1801 | QEN61CM-476Z | BP E CAP. | 47μF 16V M |
| | C1805 | QFV71HJ-224MZ | TF CAP. | 0.22μF 50V J |
| | C1806 | QCT25CH-181Z | C CAP. | 180pF 50V J |
| | C1807 | QCT25CH-101AZ | C CAP. | 100pF 50V J |
| | C1808 | QFLC1HJ-102MZ | M CAP. | 1000pF 50V J |
| | C1809 | QFLC1HJ-153MZ | M CAP. | 0.015μF 50V J |
| | C1811 | QFLC1HJ-222MZ | M CAP. | 2200pF 50V J |
| | C1812 | QCT25CH-560Z | C CAP. | 56pF 50V J |
| | C1813 | QCT25CH-270Z | C CAP. | 27pF 50V J |
| | C1816 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| | C1827 | QFLC1HJ-104MZ | M CAP. | 0.1μF 50V J |
| | C1828 | QFLC1HJ-104MZ | M CAP. | 0.1μF 50V J |
| | C1829 | QFLC1HJ-104MZ | M CAP. | 0.1μF 50V J |
| | C1836 | QFLC1HJ-102MZ | M CAP. | 1000pF 50V J |
| | C1837 | QFLC1HJ-103MZ | M CAP. | 0.01μF 50V J |
| | C1838 | QFLC1HJ-104MZ | M CAP. | 0.1μF 50V J |
| | C1839 | QFLC1HJ-104MZ | M CAP. | 0.1μF 50V J |
| | C1840 | QFLC1HJ-104MZ | M CAP. | 0.1μF 50V J |
| | C1844 | QFLC1HJ-222MZ | M CAP. | 2200pF 50V J |
| | C1847 | QFV71HJ-224MZ | TF CAP. | 0.22μF 50V J |
| | C1848 | QFV71HJ-224MZ | TF CAP. | 0.22μF 50V J |
| | C1866 | QFV71HJ-474MZ | TF CAP. | 0.47μF 50V J |
| | C1867 | QFLC1HJ-103MZ | M CAP. | 0.01μF 50V J |
| | TRANSFORMER | | | |
| ⚠ | T1502 | CE40361-00B | SW DRIVE TRANSF | |
| | COIL | | | |
| | L1302 | CELP027-8R2Z | PEAKING COIL | |
| | L1303 | CELP027-8R2Z | PEAKING COIL | |
| ⚠ | L1501 | CE41197-00D | WIDTH COIL | |
| ⚠ | L1502 | CE41238-00A | WIDTH COIL | |
| ⚠ | L1503 | A39934 | LINEARITY COIL | |
| | L1504 | CJ30030-056 | HEATER CHOKE | |
| | DIODE | | | |
| | D1206 | 1SS133-T2 | SI. DIODE | |
| | D1207 | 1SS133-T2 | SI. DIODE | |
| | D1208 | 1SS133-T2 | SI. DIODE | |
| | D1209 | 1SS133-T2 | SI. DIODE | |
| | D1210 | 1SS133-T2 | SI. DIODE | |

| SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|
| DIODE | | | |
| D1213 | 1SS133-T2 | SI. DIODE | |
| D1214 | 1SS133-T2 | SI. DIODE | |
| D1215 | 1SS133 | SI. DIODE | |
| D1401 | 1SR35-100A-HJ | SI. DIODE | |
| D1404 | DFA1A4-4 | SI. DIODE | |
| D1405 | 1SS133-T2 | SI. DIODE | |
| D1408 | 1SS133-T2 | SI. DIODE | |
| D1409 | MA4051 (M) -T2 | ZENER DIODE | |
| D1410 | MA4051 (M) -T2 | ZENER DIODE | |
| D1411 | 1SS133-T2 | SI. DIODE | |
| D1412 | 1SS133-T2 | SI. DIODE | |
| D1416 | 1SS133-T2 | SI. DIODE | |
| D1417 | 1SS133-T2 | SI. DIODE | |
| ⚠ D1502 | HZ7B2L-C1 | ZENER DIODE | |
| D1503 | 1SR35-100A-HJ | SI. DIODE | |
| D1504 | 1SR35-100A-HJ | SI. DIODE | |
| D1505 | 1SS133-T2 | SI. DIODE | |
| D1508 | 1SS133-T2 | SI. DIODE | |
| D1509 | DFA1A4-4 | SI. DIODE | |
| D1510 | 1SS133-T2 | SI. DIODE | |
| D1511 | DFA1A4-4 | SI. DIODE | |
| D1512 | DFA1A4-4 | SI. DIODE | |
| D1513 | DFA1A4-4 | SI. DIODE | |
| D1514 | U19E-C2 | SI. DIODE | |
| D1515 | 1SS133-T2 | SI. DIODE | |
| D1516 | MA4220 (M) -T2 | ZENER DIODE | |
| D1517 | 1SS133-T2 | SI. DIODE | |
| D1518 | DFA1A4-4 | SI. DIODE | |
| D1519 | 1SS133-T2 | SI. DIODE | |
| D1520 | 1SS133-T2 | SI. DIODE | |
| D1522 | MA4068 (M) -T2 | ZENER DIODE | |
| D1801 | 1SS133-T2 | SI. DIODE | |
| D1802 | 1SS133-T2 | SI. DIODE | |
| D1807 | 1SS133-T2 | SI. DIODE | |
| D1808 | 1SS133-T2 | SI. DIODE | |
| D1809 | 1SS133-T2 | SI. DIODE | |
| D1810 | 1SS133-T2 | SI. DIODE | |
| D1811 | 1SS133-T2 | SI. DIODE | |
| D1812 | 1SS133-T2 | SI. DIODE | |
| D1813 | 1SS133-T2 | SI. DIODE | |
| D1814 | 1SS133-T2 | SI. DIODE | |
| D1815 | 1SS133-T2 | SI. DIODE | |
| D1816 | 1SS133-T2 | SI. DIODE | |
| D1817 | 1SS133-T2 | SI. DIODE | |
| D1820 | 1SS133-T2 | SI. DIODE | |
| D1821 | 1SS133-T2 | SI. DIODE | |
| D1823 | RD5.6ES (B3) -T2 | ZENER DIODE | |
| D1824 | RD11ES (B3) -T2 | ZENER DIODE | |
| D1825 | 1SS133-T2 | SI. DIODE | |
| D1950 | GL5PG23 | L. E. D. | |
| TRANSISTOR | | | |
| Q1201 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1202 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1203 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1205 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1207 | 2SA933S (QR) -T | SI. TRANSISTOR | |
| Q1209 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1210 | 2SC1740S (QR) -T | SI. TRANSISTOR | |

| SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|
| TRANSISTOR | | | |
| Q1221 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1222 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1223 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1225 | 2SA933S (QR) -T | SI. TRANSISTOR | |
| Q1226 | 2SA933S (QR) -T | SI. TRANSISTOR | |
| Q1301 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1302 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1401 | 2SC1740S (R) -T | SI. TRANSISTOR | |
| Q1402 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1403 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1404 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1501 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1502 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1503 | 2SC1627A (Y) -T | SI. TRANSISTOR | |
| Q1504 | 2SD1556-C1 | SI. TRANSISTOR | |
| Q1505 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1506 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1801 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1802 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1803 | 2SA933S (QR) -T | SI. TRANSISTOR | |
| Q1804 | 2SA933S (QR) -T | SI. TRANSISTOR | |
| Q1805 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1806 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1807 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1811 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1812 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1813 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1817 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1818 | 2SA933S (QR) -T | SI. TRANSISTOR | |
| Q1819 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1820 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1821 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1824 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1825 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1826 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1827 | 2SC1906-T | SI. TRANSISTOR | |
| Q1828 | 2SC1906-T | SI. TRANSISTOR | |
| Q1829 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q1830 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| IC | | | |
| IC1201 | MC14066BCP | I. C. | |
| IC1202 | TC4538BP | I. C (DIGI-MOS) | |
| IC1401 | AN5521 | I. C. | |
| IC1501 | HA11423 | I. C. (M) | |
| IC1502 | TA7812S | I. C (MONO-ANA) | |
| IC1602 | AN5265 | I. C. | |
| IC1801 | TC4538BP | I. C (DIGI-MOS) | |
| IC1802 | MC14066BCP | I. C. | |
| IC1803 | TC4538BP | I. C (DIGI-MOS) | |
| IC1804 | AN5860 | I. C. (M) | |
| IC1805 | TC4538BP | I. C (DIGI-MOS) | |
| IC1807 | AN5352N | I. C. | |
| OTHERS | | | |
| DL1201 | CE41679-001 | DELAY LINE | |
| DL1302 | CE41489-001 | DELAY LINE (1H) | |
| ⚠ FR1538 | QRZ0054-4R7M | F R | 4.7 Ω 1/4W J |
| RY1501 | CESK006-001 | RELAY | |
| S1101 | QST2731-C01 | PUSH SWITCH | FRONT CONTROL SW |

| SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|
| OTHERS | | | |
| S1401 | QSL4A13-C02 | LEVER SWITCH | V. CENTER SW |
| S1501 | QSL4A13-C02 | LEVER SWITCH | H. CENTER SW |
| ⚠ S1901 | QSP4D21-C06 | PUSH SWITCH | POWER SW |
| TH1201 | A75575-332 | N. THERMISTOR | 3.3kΩ |

## 2.DECODER PW BOARD ASS'Y (FM-1001A)

| SYMBOL NO. | PART NO. | PART NAME | REMARKS | | |
|---|---|---|---|---|---|
| VARIABLE R | | | | | |
| R1303 | QVPA603-222A | V R (DL AMP) | 2.2kΩ B | | |
| CAPACITOR | | | | | |
| C1101 | QEN61CM-336Z | BP E CAP. | 33μF | 16V | M |
| C1102 | QFV71HJ-104MZ | TF CAP. | 0.1μF | 50V | J |
| C1107 | QFLC1HK-103MZ | M CAP. | 0.01μF | 50V | K |
| C1201 | QFV71HJ-224MZ | TF CAP. | 0.22μF | 50V | J |
| C1202 | QFV71HJ-104MZ | TF CAP. | 0.1μF | 50V | J |
| C1301 | QFLC1HK-103MZ | M CAP. | 0.01μF | 50V | K |
| C1303 | QFLC1HK-273MZ | M CAP. | 0.027μF | 50V | K |
| C1304 | QFLB1HK-103M | M CAP. | 0.01μF | 50V | K |
| C1306 | QFLB1HK-103M | M CAP. | 0.01μF | 50V | K |
| C1307 | QFLC1HK-103MZ | M CAP. | 0.01μF | 50V | K |
| C1309 | QEN61CM-106Z | BP E CAP. | 10μF | 16V | M |
| C1310 | QFLC1HK-683MZ | M CAP. | 0.068μF | 50V | K |
| C1311 | QFLC1HJ-562MZ | M CAP. | 5600pF | 50V | J |
| C1312 | QAT3661-300M | TRIM CAP. | 30pF | | |
| C1313 | QCT25CH-150Z | C CAP. | 15pF | 50V | J |
| C1315 | QFLC1HK-103MZ | M CAP. | 0.01μF | 50V | K |
| C1316 | QFLC1HK-103MZ | M CAP. | 0.01μF | 50V | K |
| C1399 | QFV71HJ-104MZ | TF CAP. | 0.1μF | 50V | J |
| TRANSFORMER | | | | | |
| T1301 | CELT034-002 | B P TRANSF | | | |
| COIL | | | | | |
| L1101 | CELP027-8R2Z | PEAKING COIL | | | |
| DIODE | | | | | |
| D1201 | 1SS133-T2 | SI. DIODE | | | |
| D1202 | 1SS133-T2 | SI. DIODE | | | |
| TRANSISTOR | | | | | |
| Q1101 | 2SA933 (QR) -T | SI. TRANSISTOR | | | |
| Q1301 | 2SC1740S (QR) -T | SI. TRANSISTOR | | | |
| IC | | | | | |
| IC1101 | AN5615 | I. C. | | | |
| IC1301 | AN5625N | I. C. (M) | | | |
| OTHERS | | | | | |
| X1301 | CE41953-001 | CRYSTAL | | | |

## 3.CRT SOCKET PW BOARD ASS'Y (FX-3018A)

| SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|
| VARIABLE R | | | |
| R3702 | QVPE805-201H | V R (R DRIVE) | 200 Ω B |
| R3705 | QVPE805-502H | V R (R CUT OFF) | 5kΩ B |
| R3712 | QVPE805-201H | V R (G DRIVE) | 200 Ω B |
| R3715 | QVPE805-502H | V R (G CUT OFF) | 5kΩ B |
| R3725 | QVPE805-502H | V R (B CUT OFF) | 5kΩ B |
| RESISTOR | | | |
| R3706 | QRD123J-103SX | C R | 10kΩ 1/2W J |
| R3708 | QRG029J-822A | OM R | 8.2kΩ 2W J |
| R3716 | QRD123J-103SX | C R | 10kΩ 1/2W J |
| R3718 | QRG029J-822A | OM R | 8.2kΩ 2W J |
| R3726 | QRD123J-103SX | C R | 10kΩ 1/2W J |
| R3728 | QRG029J-822A | OM R | 8.2kΩ 2W J |
| R3733 | ERZ-C05VK271Z | VARISTOR | 270 Ω |
| CAPACITOR | | | |
| C3709 | QFH63BK-223M | MM CAP. | 0.022μF 1250V K |
| C3713 | QFV71HJ-224MZ | TF CAP. | 0.22μF 50V J |
| COIL | | | |
| L3701 | CELP027-820Z | PEAKING COIL | |
| L3702 | CELP026-151Z | PEAKING COIL | |
| L3703 | CELP027-820Z | PEAKING COIL | |
| L3704 | CELP026-151Z | PEAKING COIL | |
| L3705 | CELP027-820Z | PEAKING COIL | |
| L3706 | CELP026-151Z | PEAKING COIL | |
| DIODE | | | |
| D3704 | 1SS133-T2 | SI. DIODE | |
| D3705 | 1SS133-T2 | SI. DIODE | |
| D3706 | RM2C-LFA1 | SI. DIODE | |
| TRANSISTOR | | | |
| Q3701 | 2SC4544-C1 | POWER TRANSISTOR | |
| Q3702 | 2SC4502-T | SI. TRANSISTOR | |
| Q3703 | 2SC4544-C1 | POWER TRANSISTOR | |
| Q3704 | 2SC4502-T | SI. TRANSISTOR | |
| Q3705 | 2SC4544-C1 | POWER TRANSISTOR | |
| Q3706 | 2SC4502-T | SI. TRANSISTOR | |
| OTHERS | | | |
| ⚠ | CE41602-001 | C. R. T. SOCKET | |

## 4.INPUT PW BOARD ASS'Y (FX-6021A)

| SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|
| VARIABLE R | | | |
| R6738 | QVPA603-223AZ | V R (RGB CONT) | 22kΩ B |
| R6739 | QVPA603-472AZ | V R (RGB BRIGHT) | 4.7kΩ B |
| RESISTOR | | | |
| R6201 | QRV141F-75R0AY | MF R | 75 Ω 1/4W F |
| R6202 | QRV141F-75R0AY | MF R | 75 Ω 1/4W F |
| R6213 | QRV141F-75R0AY | MF R | 75 Ω 1/4W F |
| R6301 | QRV141F-75R0AY | MF R | 75 Ω 1/4W F |
| R6602 | QRD143J-153SX | C R | 15kΩ 1/4W J |
| R6607 | QRD143J-153SX | C R | 15kΩ 1/4W J |
| R6611 | QRD143J-153SX | C R | 15kΩ 1/4W J |
| R6630 | QRD143J-153SX | C R | 15kΩ 1/4W J |
| R6720 | QRV141F-75R0AY | MF R | 75 Ω 1/4W F |
| R6721 | QRV141F-75R0AY | MF R | 75 Ω 1/4W F |
| R6723 | QRV141F-75R0AY | MF R | 75 Ω 1/4W F |
| CAPACITOR | | | |
| C6201 | QEKB1HM-475GM | E CAP. | 4.7μF 50V M |
| C6202 | QEKB1HM-475GM | E CAP. | 4.7μF 50V M |
| C6214 | QEKC1HM-475GMZ | E CAP. | 4.7μF 50V M |
| C6230 | QFLC1HJ-103MZ | M CAP. | 0.01μF 50V J |
| C6232 | QFV71HJ-224MZ | TF CAP. | 0.22μF 50V J |
| C6234 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C6235 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C6236 | QAT3710-300MZ | TRIM CAP. | |
| C6237 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C6238 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C6301 | QFLC1HJ-103MZ | M CAP. | 0.01μF 50V J |
| C6703 | QEN61CM-107Z | BP E CAP. | 100μF 16V M |
| C6707 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C6710 | QFLC1HK-104MZ | M CAP. | 0.1μF 50V K |
| C6711 | QFLC1HK-104MZ | M CAP. | 0.1μF 50V K |
| C6714 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| C6715 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V J |
| COIL | | | |
| L6203 | CELP027-220Z | PEAKING COIL | |
| DIODE | | | |
| D6201 | 1SS133-T2 | SI. DIODE | |
| D6202 | MA29W(B)-T2 | SI. VARISTOR | |
| D6203 | 1SS133-T2 | SI. DIODE | |
| D6204 | MA29W(B)-T2 | SI. VARISTOR | |
| D6208 | 1SS133-T2 | SI. DIODE | |
| D6209 | MA29W(B)-T2 | SI. VARISTOR | |
| D6213 | 1SS133-T2 | SI. DIODE | |
| D6301 | 1SS133-T2 | SI. DIODE | |
| D6302 | MA29W(B)-T2 | SI. VARISTOR | |
| D6303 | 1SS133-T2 | SI. DIODE | |
| D6701 | 1SS133-T2 | SI. DIODE | |
| D6702 | MA29W(B)-T2 | SI. VARISTOR | |
| D6703 | 1SS133-T2 | SI. DIODE | |
| D6704 | MA29W(B)-T2 | SI. VARISTOR | |
| D6705 | 1SS133-T2 | SI. DIODE | |
| D6706 | MA29W(B)-T2 | SI. VARISTOR | |
| D6707 | MA29W(B)-T2 | SI. VARISTOR | |
| D6708 | 1SS133-T2 | SI. DIODE | |
| D6710 | MA27W(B) | SI. VARISTOR | |
| TRANSISTOR | | | |
| Q6201 | 2SC1740S(R)-T | SI. TRANSISTOR | |
| Q6202 | 2SC1740S(R)-T | SI. TRANSISTOR | |

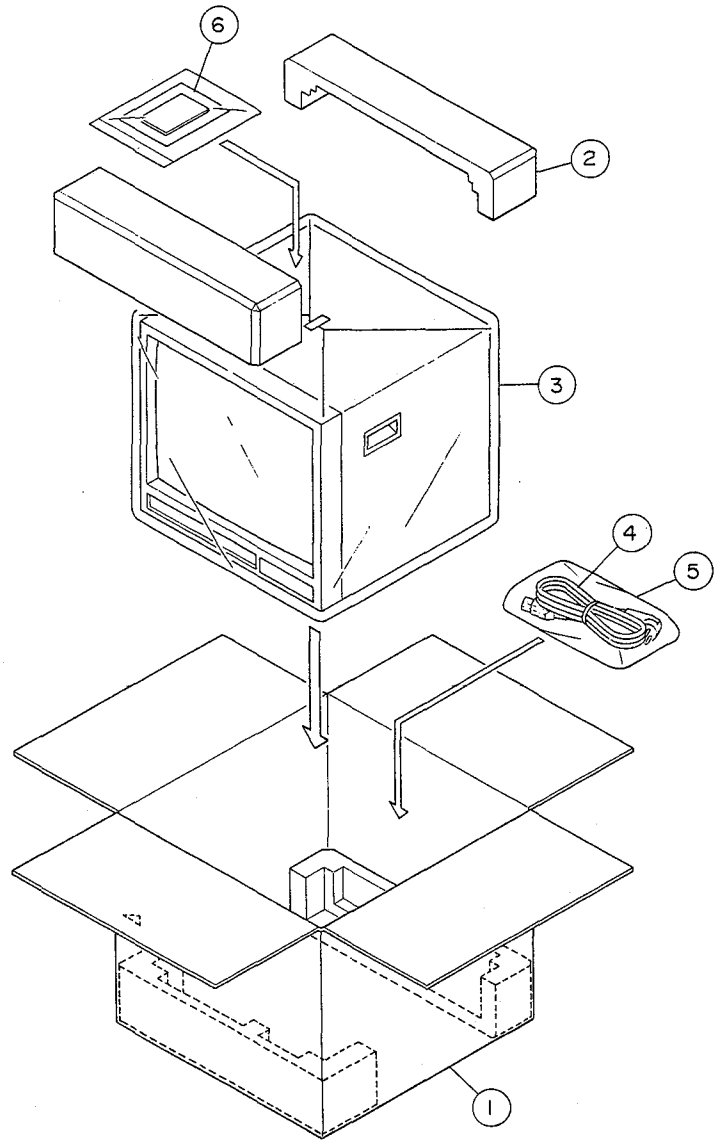
| SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|
| TRANSISTOR | | | |
| Q6203 | 2SC1740S (R) -T | SI. TRANSISTOR | |
| Q6207 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6208 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6209 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6210 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6211 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6212 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6213 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6214 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6304 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6305 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6306 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6307 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6601 | 2SC1740S (R) -T | SI. TRANSISTOR | |
| Q6602 | 2SC1740S (R) -T | SI. TRANSISTOR | |
| Q6603 | 2SC1740S (R) -T | SI. TRANSISTOR | |
| Q6604 | 2SC1740S (R) -T | SI. TRANSISTOR | |
| Q6605 | 2SC1740S (R) -T | SI. TRANSISTOR | |
| Q6606 | 2SC1740S (R) -T | SI. TRANSISTOR | |
| Q6607 | 2SC1740S (R) -T | SI. TRANSISTOR | |
| Q6701 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6702 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6703 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6704 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| Q6806 | 2SC1740S (QR) -T | SI. TRANSISTOR | |
| IC | | | |
| IC6201 | LA7016 | I. C. | |
| IC6202 | MC14066BCP | I. C. | |
| IC6601 | MC14066BCP | I. C. | |
| IC6602 | LA7016 | I. C. | |
| IC6701 | AN6551 | I. C. (M) | |
| OTHERS | | | |
| | CM47328-A0A | TERMINAL ASSY A | |
| | CM47329-A0A | TERMINAL ASSY B | |
| | CM47330-A0A | TERMINAL ASSY C | |
| S6201 | QSS4C22-C02 | SLIDE SWITCH | OPEN/75Ω SELECT SW |
| S6202 | QSS4C22-C02 | SLIDE SWITCH | OPEN/75Ω SELECT SW |
| S6203 | QSS4C22-C02 | SLIDE SWITCH | SET UP |
| S6204 | QSS4C22-C02 | SLIDE SWITCH | OPEN/75Ω SELECT SW |
| S6501 | QSS4C22-C02 | SLIDE SWITCH | AFC |
| S6701 | QSS4C22-C02 | SLIDE SWITCH | OPEN/75Ω SELECT SW |
| S6702 | QSS4C22-C02 | SLIDE SWITCH | OPEN/75Ω SELECT SW |
| S6703 | QSS4C22-C02 | SLIDE SWITCH | OPEN/75Ω SELECT SW |
| S6704 | QSS4C22-C02 | SLIDE SWITCH | OPEN/75Ω SELECT SW |

## 5.POWER PW BOARD ASS'Y (FX-9023A)

| | SYMBOL NO. | PART NO. | PART NAME | REMARKS | |
|---|---|---|---|---|---|
| | VARIABLE R | | | | |
| | R9913 | QVPE805-104H | V R(B1 ADJ) | 100kΩ B | |
| | RESISTOR | | | | |
| ⚠ | R9001 | QRZ0096-1R5 | UNF WW R | 1.5 Ω 3W | F |
| | R9003 | QRZ0095-2R2 | UNF WW R | 2.2 Ω 2W | J |
| | R9006 | QRV141F-1501AY | MF R | 1.5kΩ 1/4W | F |
| | R9007 | QRV141F-4701AY | MF R | 4.7kΩ 1/4W | F |
| | R9008 | QRV141F-2002AY | MF R | 20kΩ 1/4W | F |
| | R9009 | QRG029J-183 | OM R | 18kΩ 2W | J |
| | R9010 | QRG019J-223S | OM R | 22kΩ 1W | J |
| | R9011 | QRD123J-183SX | C R | 18kΩ 1/2W | J |
| ⚠ | R9902 | QRF204K-5R6 | UNF R | 5.6 Ω 20W | K |
| | R9905 | QRD143J-473SX | C R | 47kΩ 1/4W | J |
| | R9909 | QRG019J-151S | OM R | 150 Ω 1W | J |
| | R9911 | QRG029J-473 | OM R | 47kΩ 2W | J |
| | R9912 | QRG029J-470A | OM R | 47 Ω 2W | J |
| | R9914 | QRD123J-104SX | C R | 100kΩ 1/2W | J |
| | R9916 | QRM055K-R22 | MP R | 0.22 Ω 5W | K |
| | R9918 | QRX019J-3R9S | MF R | 3.9 Ω 1W | J |
| | R9919 | QRG029J-333A | OM R | 33kΩ 2W | J |
| | R9921 | QRD149J-561S | C R | 560 Ω 1/4W | J |
| | R9922 | QRD149J-2R2S | C R | 2.2 Ω 1/4W | J |
| | CAPACITOR | | | | |
| | C9003 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V | J |
| ⚠ | C9901 | QFZ9022-224M | M F CAP. | 0.22μFAC250V | M |
| ⚠ | C9903 | QFZ9031-105M | M M CAP. | 1μFAC250V | M |
| ⚠ | C9905 | QCZ9034-472A | C CAP. | 4700pFAC400V | P |
| ⚠ | C9906 | QCZ9034-472A | C CAP. | 4700pFAC400V | P |
| ⚠ | C9907 | QCZ9034-472A | C CAP. | 4700pFAC400V | P |
| ⚠ | C9908 | QCZ9034-472A | C CAP. | 4700pFAC400V | P |
| ⚠ | C9911 | QEZ0111-337R | E CAP. | 330μF 400V | M |
| | C9916 | QCZ0122-391U | C CAP. | 390μF 2000V | K |
| | C9917 | QCZ0122-821U | C CAP. | 820μF 2000V | K |
| | C9918 | QCZ0122-821U | C CAP. | 820μF 2000V | K |
| | C9919 | QCF22HP-103M | CH C CAP. | 0.01μF 500V | P |
| | C9921 | QEHC2AM-107MZ | E CAP. | 100μF 100V | M |
| | C9923 | QEHC2AM-107MZ | E CAP. | 100μF 100V | M |
| | C9925 | QFV71HJ-104MZ | TF CAP. | 0.1μF 50V | J |
| ⚠ | C9929 | QCZ9036-472M | C CAP. | 4700pFAC400V | M |
| ⚠ | C9931 | QCZ9036-472M | C CAP. | 4700pFAC400V | M |
| | C9934 | QCZ0122-471A | C CAP. | 470pF 2000V | K |
| ⚠ | C9943 | QCZ9036-472M | C CAP. | 4700pFAC400V | M |
| | TRANSFORMER | | | | |
| ⚠ | T9901 | CE42117-00B | SWITCHING TRANSF | | |
| ⚠ | T9902 | CE41059-00B | DRIVE TRANSF. | | |
| | DIODE | | | | |
| | D9001 | RD5.6ES(B2)-T2 | ZENER DIODE | | |
| | D9002 | RD33ES(B2)-T2 | ZENER DIODE | | |
| | D9003 | SF5J42 | THYRISTOR | | |
| | D9901 | EU2A-T3 | SI. DIODE | | |
| | D9902 | RU1C-T3 | SI. DIODE | | |
| | D9903 | W06B-T3 | SI. DIODE | | |
| | D9904 | EU2A-T3 | SI. DIODE | | |
| ⚠ | D9905 | LB-156-C1 | BRIDGE DIODE | | |
| | D9906 | EU2A-T3 | SI. DIODE | | |
| | D9907 | RU4B-C1 | SI DIODE | | |
| | D9908 | R2M-LFA1 | SI. DIODE | | |
| | D9909 | 1S1555-LB13 | SI. DIODE | | |

| | SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|---|
| | DIODE | | | |
| | D9910 | W06B-T3 | SI. DIODE | |
| | D9911 | RU1C-T3 | SI. DIODE | |
| | TRANSISTOR | | | |
| | Q9001 | 2SA949 (Y) C1-T | SI. TRANSISTOR | |
| | Q9002 | 2SA949 (Y) C1-T | SI. TRANSISTOR | |
| | Q9901 | 2SC2655 (Y) -T | SI. TRANSISTOR | |
| | Q9902 | 2SA933S (QR) -T | SI. TRANSISTOR | |
| | Q9903 | 2SD982 | SI. TRANSISTOR | |
| | IC | | | |
| | IC9901 | STR54041S | I. C. (H) | |
| | OTHERS | | | |
| ⚠ | FR9908 | QRZ0054-100M | F R | 10 Ω 1/4W J |
| ⚠ | FR9924 | QRZ0055-2R2M | F R | 2.2 Ω 1/2W J |
| ⚠ | F9901 | QMF51E2-3R15S | FUSE | |
| ⚠ | LF9901 | CE41775-002 | LINE FILTER | |
| ⚠ | LF9902 | CE41775-002 | LINE FILTER | |
| ⚠ | TH9901 | A76038-T | P. THERMISTOR | |
| ⚠ | VA9902 | ERZ-C10DK621 | VARISTOR | |

# PACKING




## PACKING PARTS LIST

| SYMBOL NO. | PART NO. | PART NAME | REMARKS |
|---|---|---|---|
| 1 | CP10571-00X | PACKING CASE | |
| 2 | CP11141-A0A | CUSHION ASSY | |
| 3 | CP30004-030 | POLY BAG | |
| ⚠ 4 | QMP4908-200R | POWER CORD | |
| 5 | QPGA030-02505 | POLY COVER | |
| 6 | TM-2100E-IB-A | INST BOOK | |

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TM-2100E
Printed in Japan
9111 OI
H.F. M.H.

# TM-2100E STANDARD CIRCUIT DIAGRAM

## ■NOTE ON USING CIRCUIT DIAGRAMS

### 1.SAFETY

**The components identified by the ⚠ symbol and shading are critical for safety. For continued safety replace safety critical components only with manufactures recommended parts.**

### 2.SPECIFIED VOLTAGE AND WAVEFORM VALUES

The voltage and waveform values have been measured under the following conditions.

(1)Input signal :PAL Color bar signal
(2)Setting positions of each knob/button and variable resistor :Original setting position when shipped
(3)Internal resistance of tester :DC 20kΩ/V
(4)Oscilloscope sweeping time :H ⇒20μS/div
:V ⇒5mS/div
:Others ⇒ Sweeping time is specified
(5)Voltage values :All DC voltage values

* Since the voltage values of signal circuit vary to some extent according to adjustments, use them as reference values.

### 3.INDICATION OF PARTS SYMBOL[EXAMPLE]

●In the PW board :R1209→R209

### 4.INDICATIONS ON THE CIRCUIT DIAGRAM

**(1)Resistors**

●Resistance value
No unit :[Ω]
K :[KΩ]
M :[MΩ]
●Rated allowable power
No indication :1/6[W]
Others :As specified
●Type
No indication :Carbon resistor
OMR :Oxide metal film resistor
MFR :Metal film resistor
MPR :Metal plate resistor
UNFR :Uninflammable resistor
FR :Fusible resistor

* Composition resistor 1/2 [W] is specified as 1/2S or Comp.

**(2)Capacitors**

●Capacitance value
1or higher :[pF]
less than 1 :[μF]
●Withstand voltage
No indication :DC50[V]
Others :DC withstand voltage[V]
AC indicated :AC withstand voltage[V]

* Electrolytic Capacitors
47/50[Example]:Capacitance value[μF]/withstand voltage[V]

●Type
No indication :Ceramic capacitor
MY :Mylar capacitor
MM :Metalized mylar capacitor
PP :Polypropylene capacitor
MPP :Metalized polypropylene capacitor
MF :Metalized film capacitor
TF :Thin film capacitor
BP :Bipolar electrolytic capacitor
TAN :Tantalum capacitor

**(3)Coils**

No unit :[μH]
Others :As specified

**(4)Power Supply**

:B1(120V)
:B2(12V)
:9V
:5V

* Respective voltage values are indicated.

**(5)Test Point**

: Test point
: Only test point display

**(6)Connecting method**

: Connector
: Wrapping or soldering
: Receptacle

**(7)Ground symbol**

: LIVE side ground
: NEUTRAL side ground
: EARTH ground
: DIGITAL ground

### 5.NOTE FOR REPAIRING SERVICE

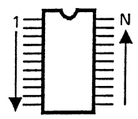
This model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE (primary : ⊥) side GND and the NEUTRAL (secondary : ⏚) side GND. Therefore, care must be taken for the following points.

(1) Do not touch the LIVE side GND or the LIVE side GND and the NEUTRAL side GND simultaneously. If the above caution is not respected, an electric shock may be caused. Therefore, make sure that the power cord is surely removed from the receptacle when, for example, the chassis is pulled out.
(2) Do not short between the LIVE side GND and NEUTRAL side GND or never measure with a measuring apparatus (oscilloscope, etc.) the LIVE side GND and NEUTRAL side GND at the same time. If the above precaution is not respected, a fuse or any parts will be broken.

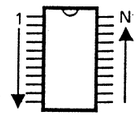
**◇ Since the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.**

Sep. 1991 No.50623

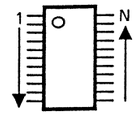
## SEMICONDUCTOR SHAPES



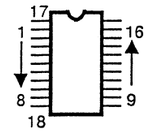

AN5352N
AN5625N
TC4538BP




AN5860




MC14066BCP

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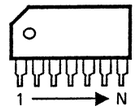


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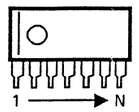


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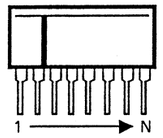


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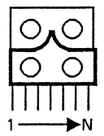
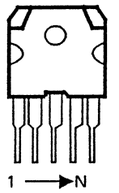



AN5521

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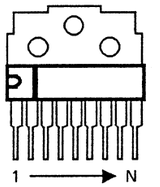
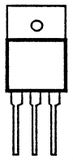
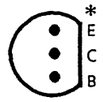


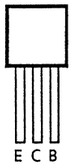

AN5265



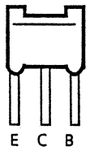

TA7812S



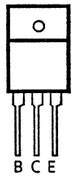

2SA933(QR)
2SA949(Y)C1
2SC1627A(Y)
2SC2655(Y)



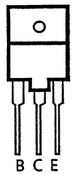

2SA933S(QR)
2SC1740S(QR)
2SC1740S(R)




2SC4502

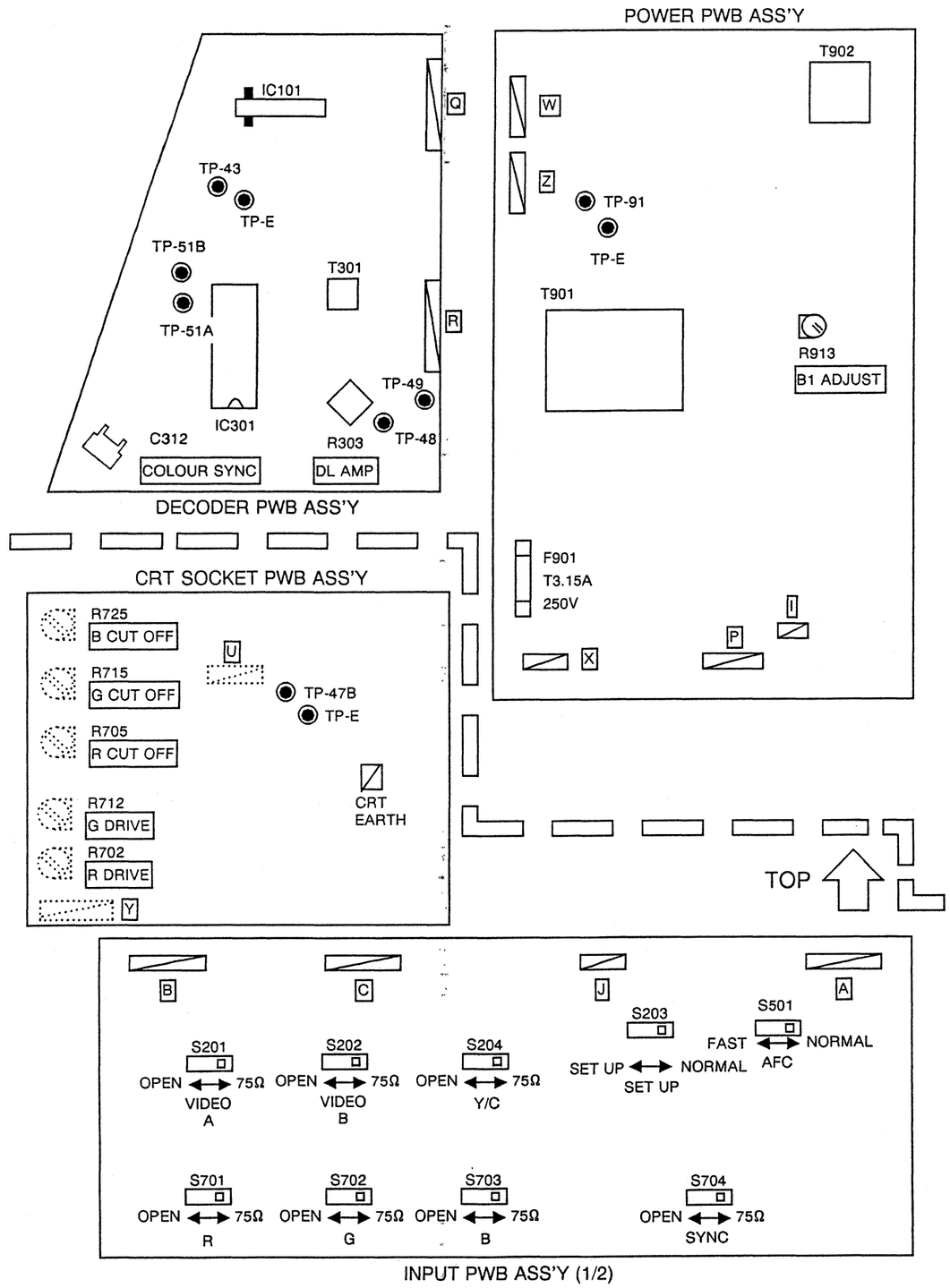



2SD982
2SC4544

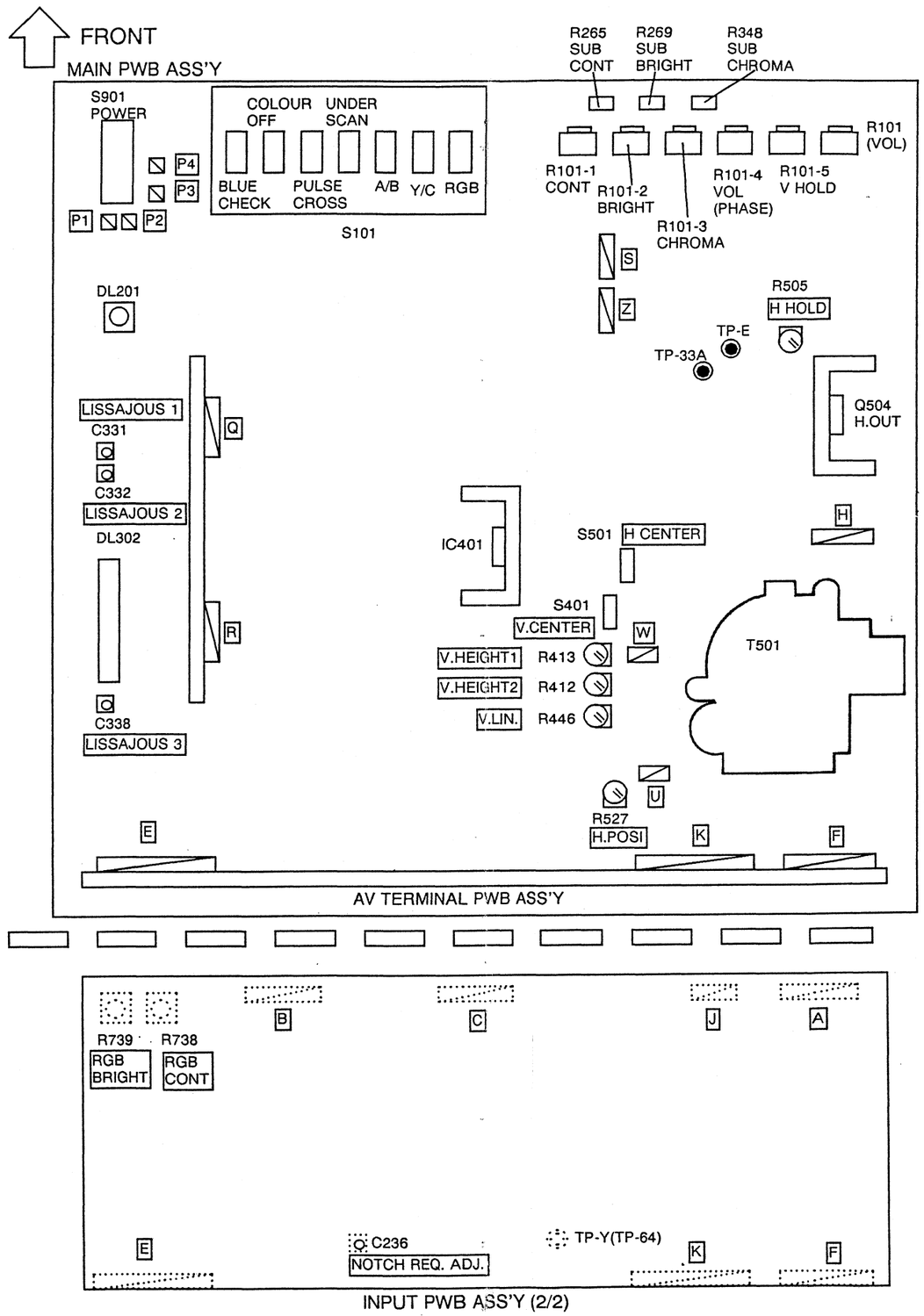



2SD1556

## MAINPARTS LOCATION AND ALIGNMENTS LOCATION

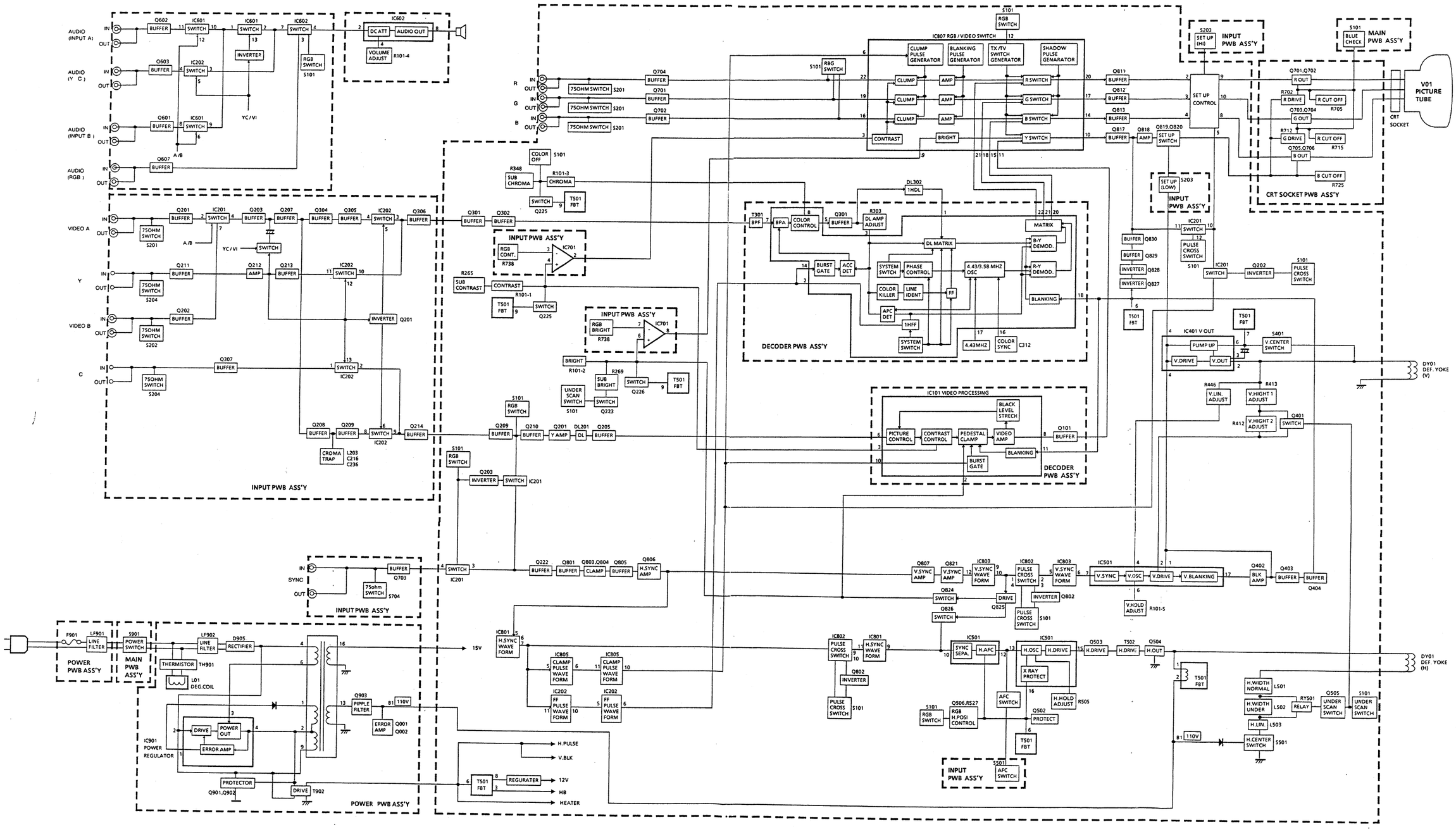



INPUT PWB ASS'Y (1/2)



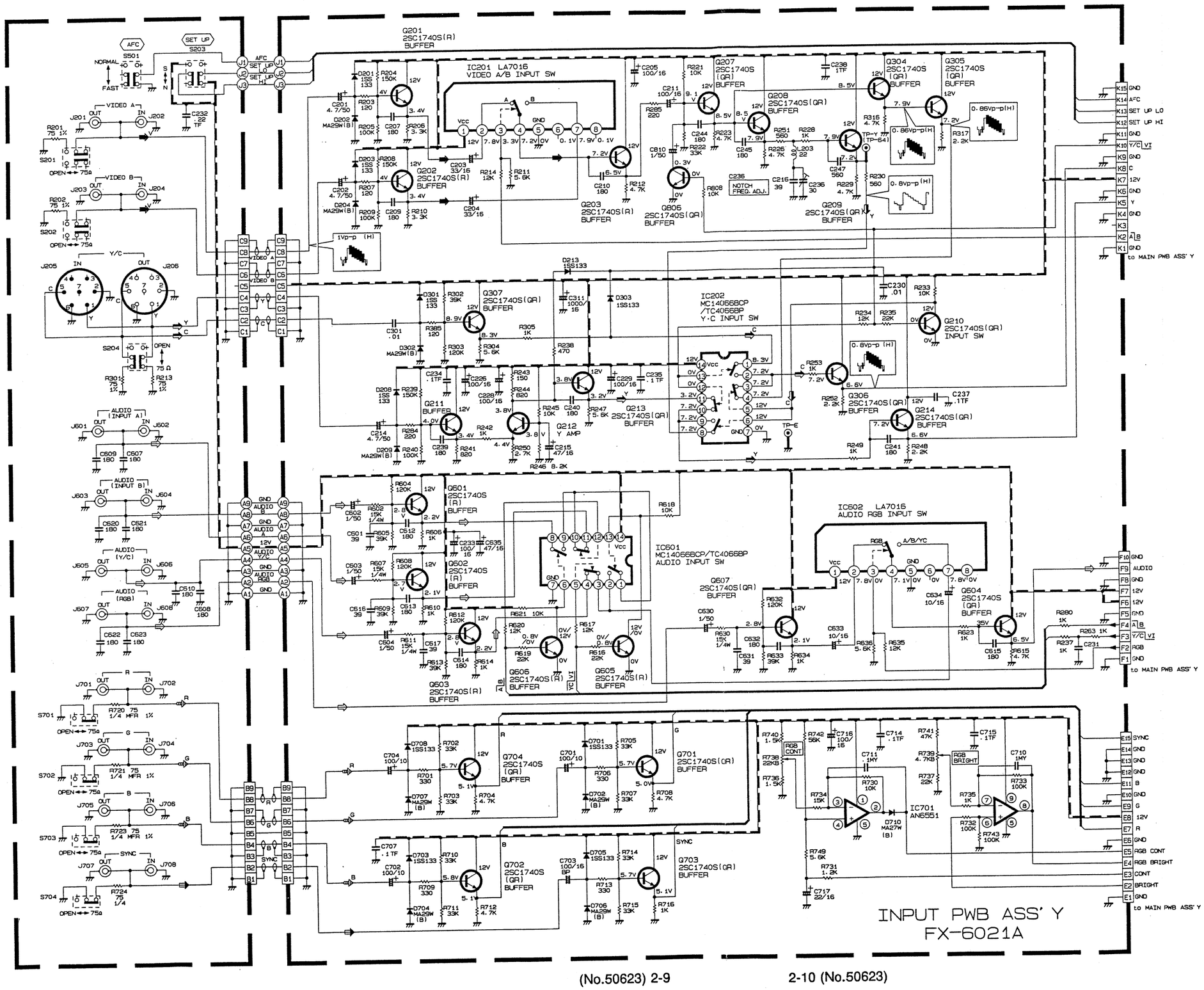

INPUT PWB ASS'Y (2/2)

# BLOCK DIAGRAM



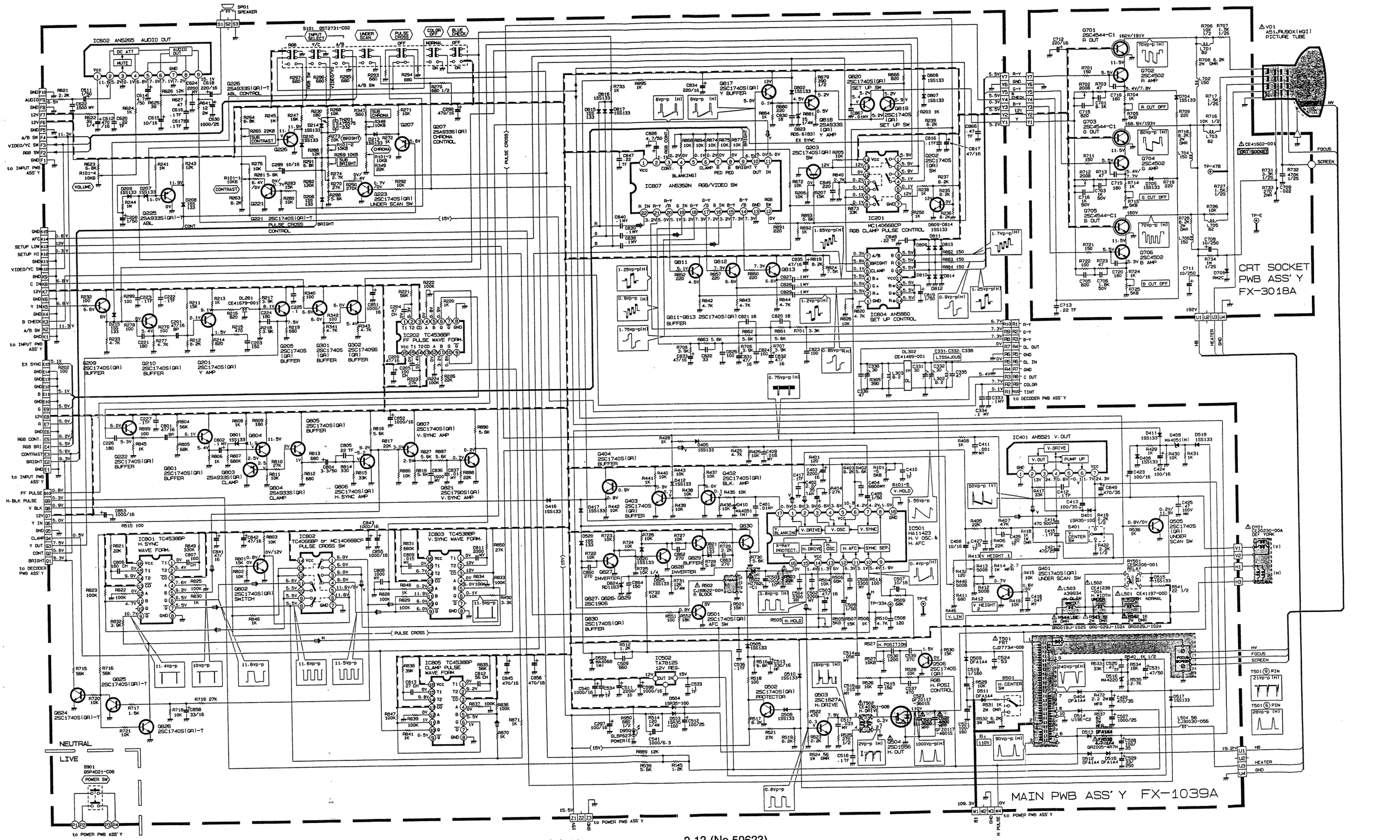
## INPUT PWB CIRCUIT DIAGRAM

Refer to the following PWB pattern. : INPUT PWB PATTERN 2-19page.



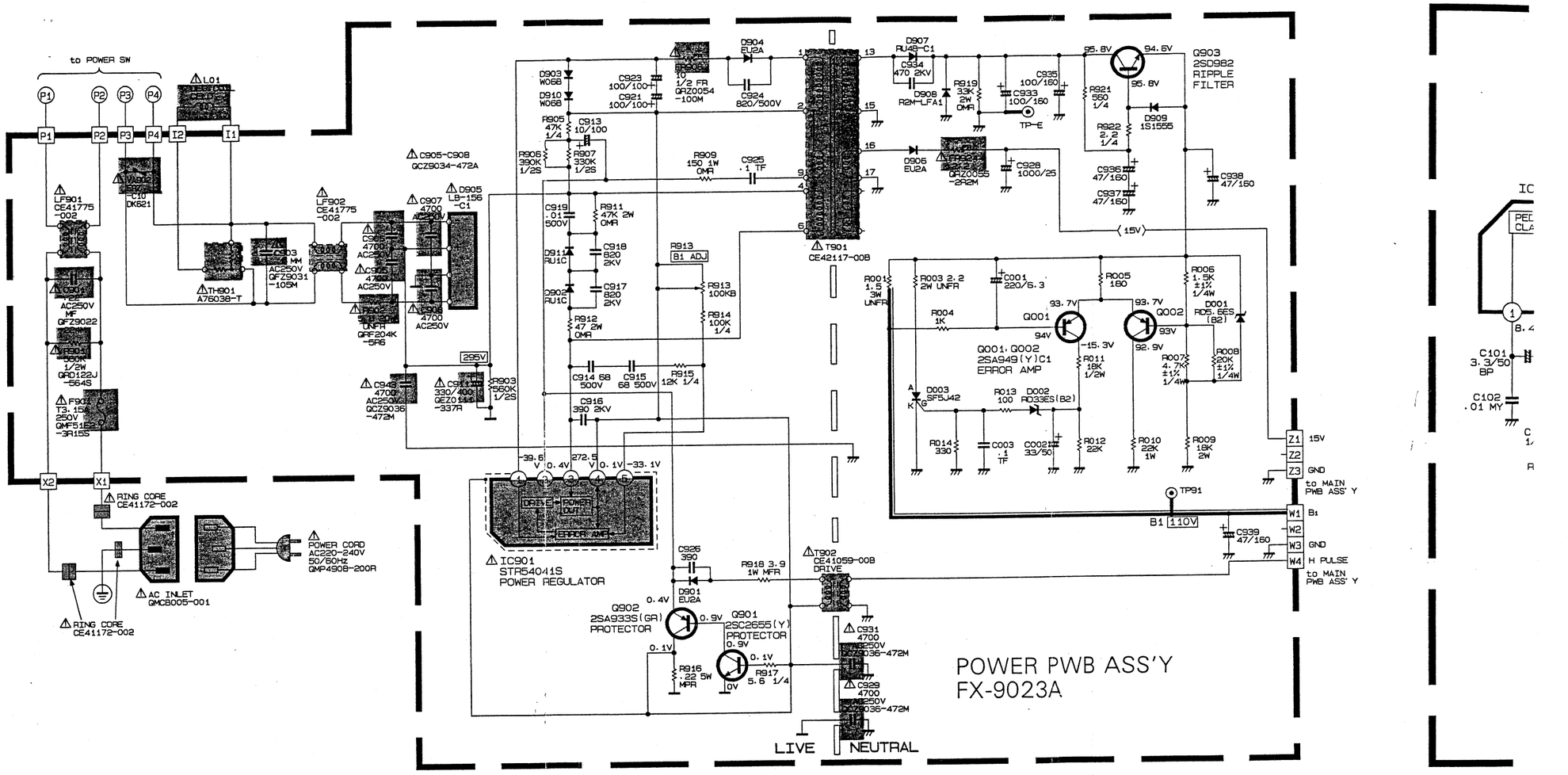
# MAIN PWB CIRCUIT DIAGRAM

Refer to the following PWB pattern. : MAIN PWB PATTERN 2-17page,CRT SOCKET PWB PATTEN 2-22page.

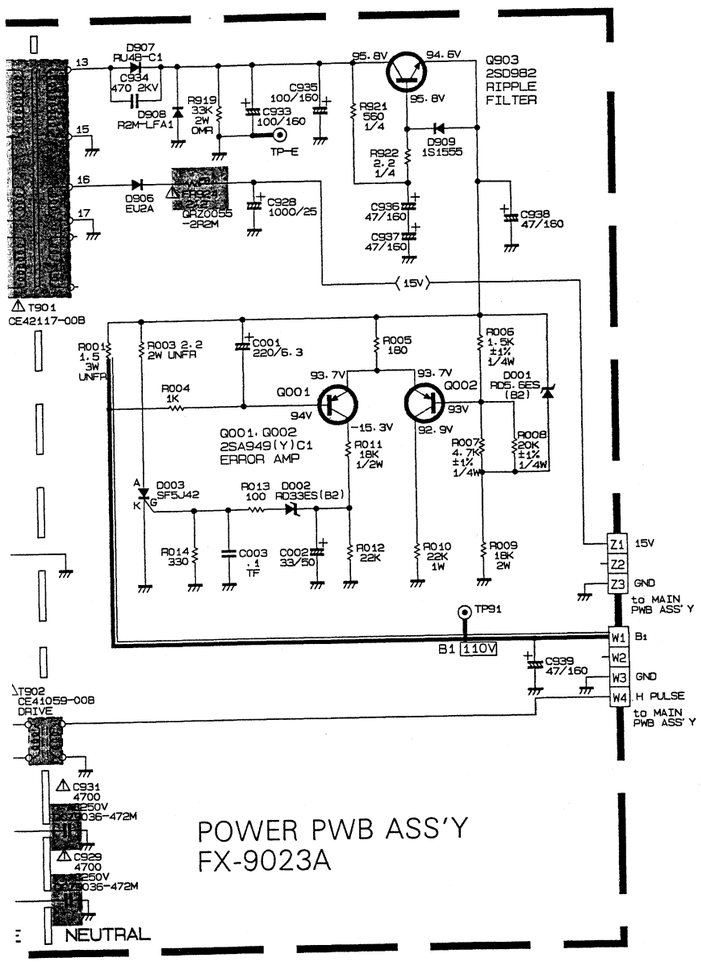


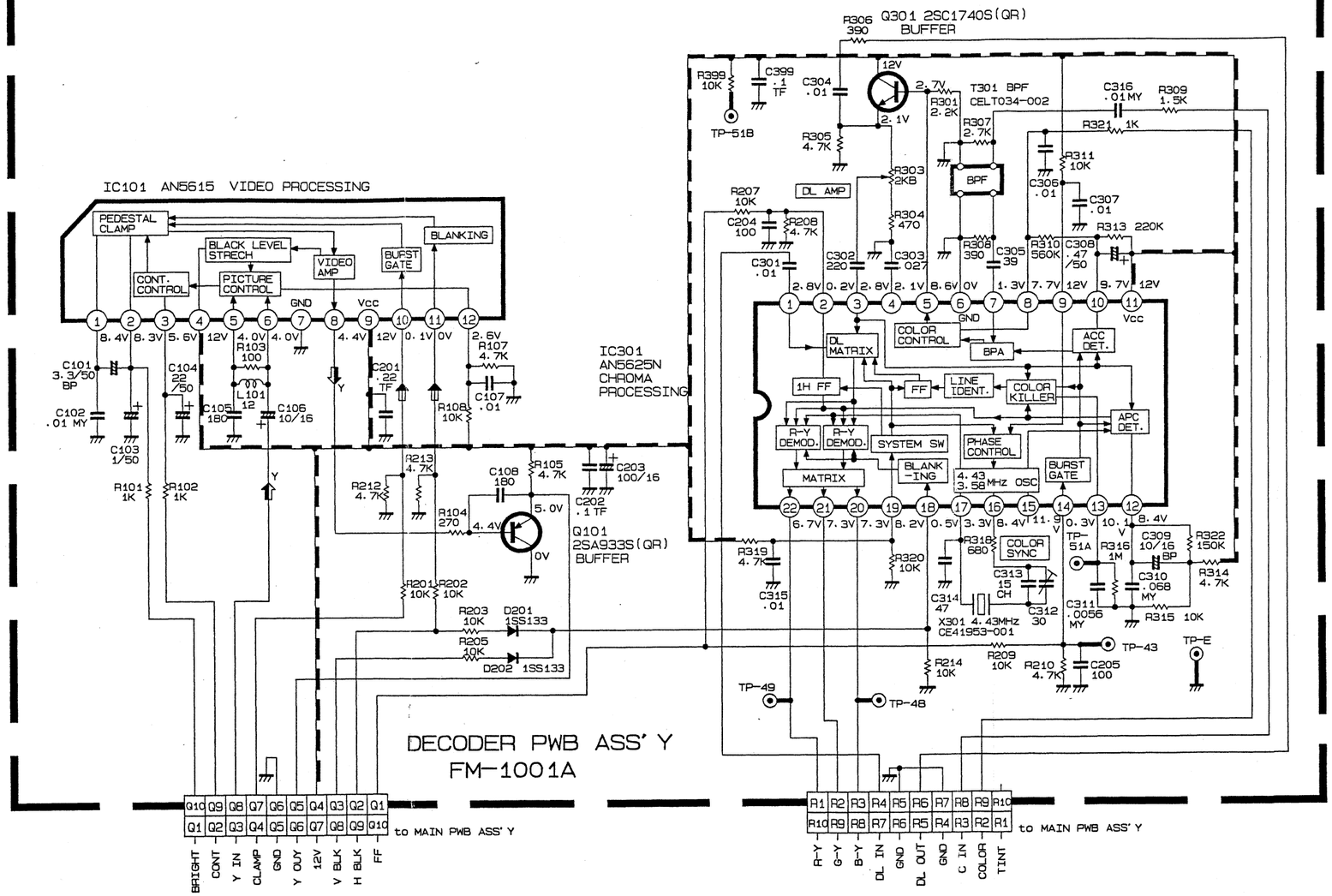
## POWER PWB,DECODER PWB CIRCUIT DIAGRAMS

Refer to the following PWB pattern. : POWER PWB PATTERN 2-21page, DECODER PWB PATT



Refer to the following PWB pattern. : POWER PWB PATTERN 2-21page, DECODER PWB PATTERN 2-22page.

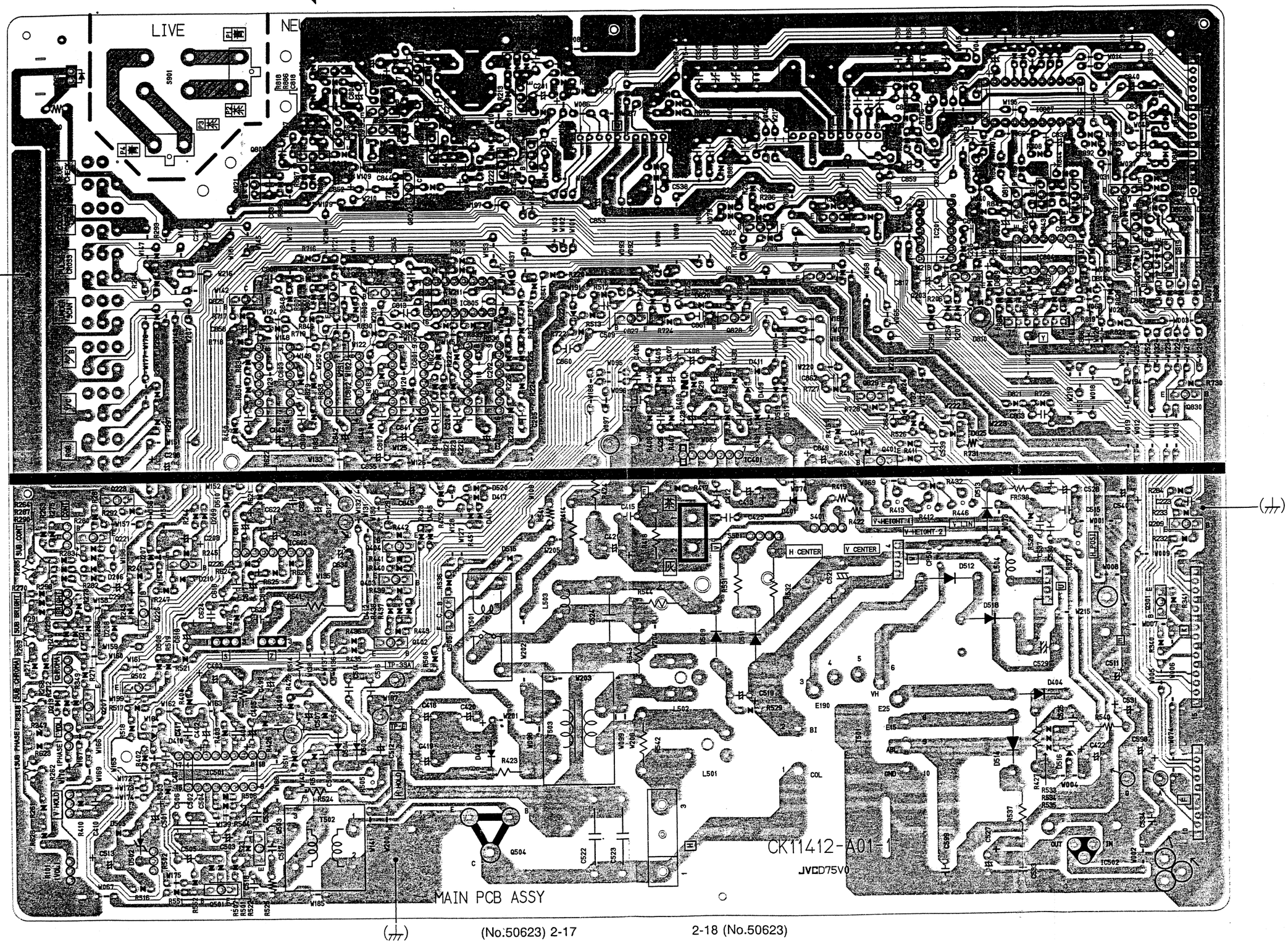


## MAIN PWB PATTERN (FX-1039A)

FRONT

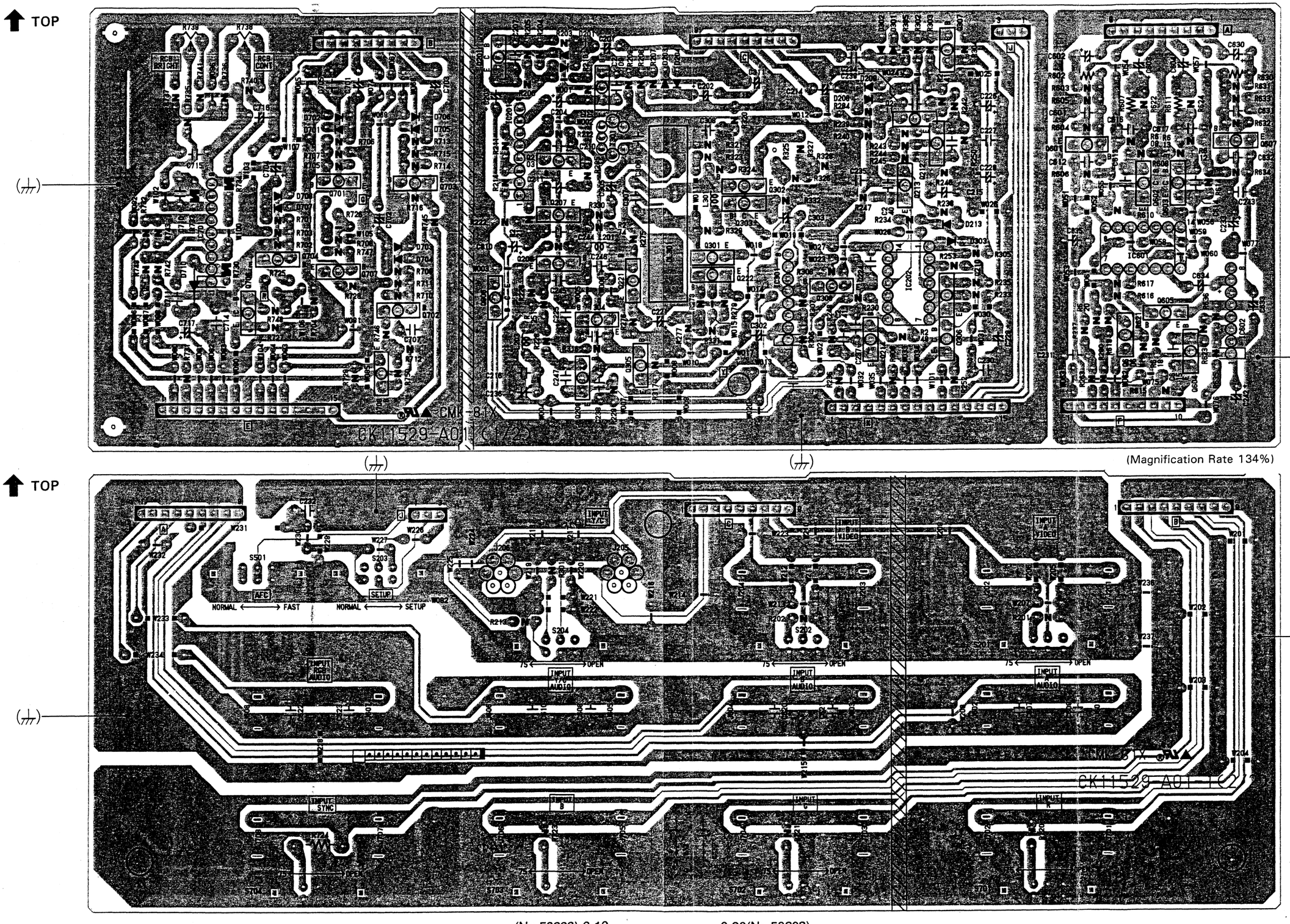
(Magnification Rate 100%)



## INPUT PWB PATTERN (FX-6021A)

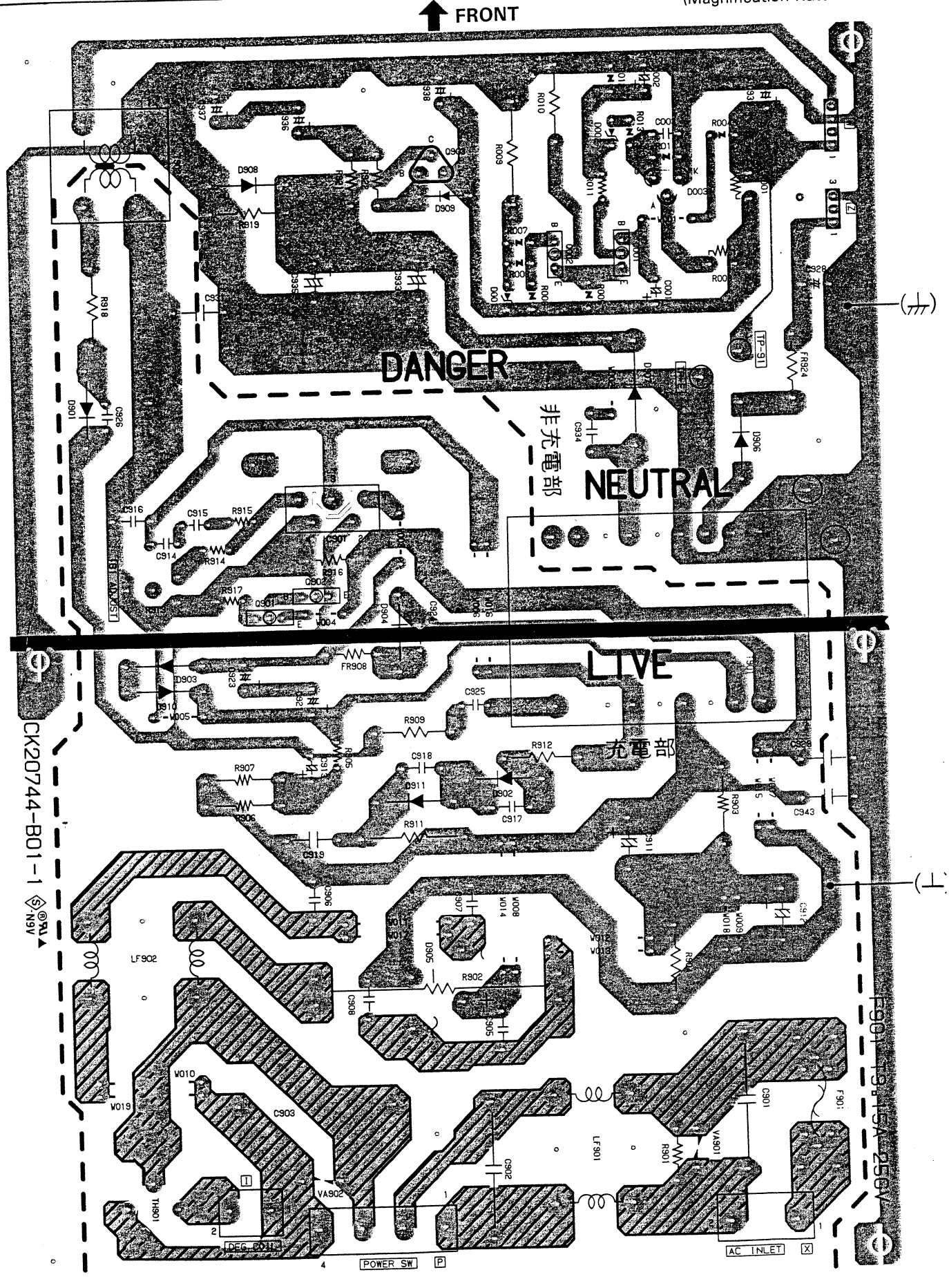
TOP

(Magnification Rate 134%)



## POWER PWB PATTERN (FX-9023A)

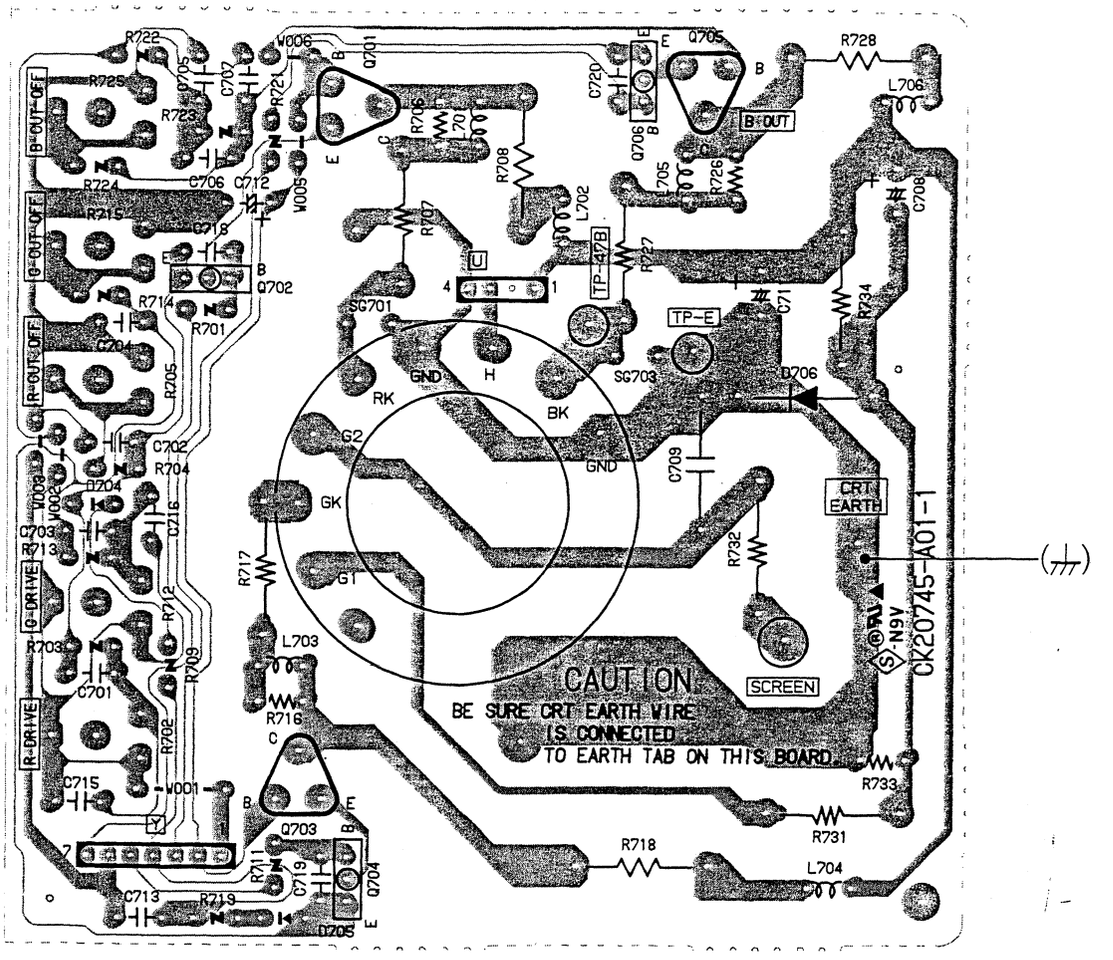
(Magnification Rate 100%)



## CRT SOCKET PWB PATTERN (FX-3018A)

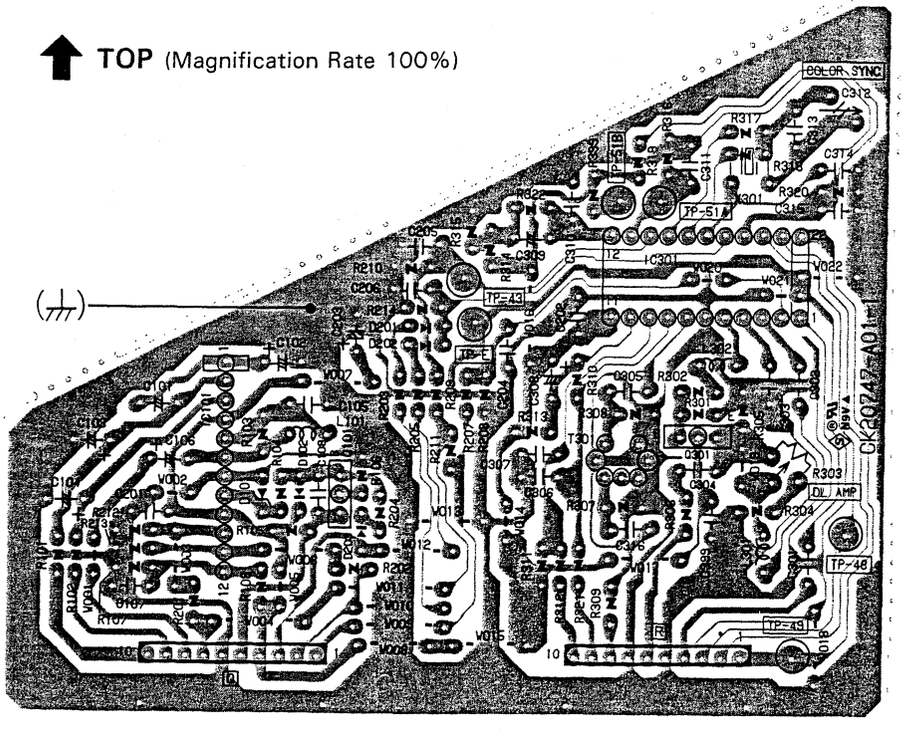
(Magnification Rate 120%)

TOP




## DECODER PWB PATTERN (FM-1001A)

TOP (Magnification Rate 100%)






OP
TN